

Getting started with your Mark 6

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This document is intended to help a new user bring a new Mark 6 to operational status. The basic steps are:

1. Unpack and physically set up the system.
2. Power on and boot-up for the first time.
3. Update the Linux distribution (already on the disk) and reconfigure to local requirements
4. Gather and install the most recent Mark 6 software
5. Setup and perform basic 'go/no-go' Mark 6 functionality test

It is recommended that you read this entire memo before starting your setup.

Setting up the Mark 6 hardware

Unpack and verify contents

When you receive your system, first unpack it, verify the contents, and check for any shipping damage.

Rack mounting

The Mark 6 is typically mounted as shown in Figure 1: Front view of rack-mounted Mark 6 system (need photo including module labeling), with the 5U 'system chassis' (with data electronics) on top, the 5U 'expansion chassis' on the bottom, and the 1U 'cable-management panel' (or simply 'cable panel') in-between. The 'system chassis' and 'expansion chassis' can be mounted immediately, leaving space for the 'cable-management panel', which will be installed later.



Figure 1: Front view of rack-mounted Mark 6 system (need photo including module labeling)

Apply labels and connect the mini-SAS cables

Install supplied labels (if not already installed) and connect the cables as follows:

1. Label the module slots and the cable panel:
 - a. Label the "system chassis" (w/motherboard) with banks "1" and "2" (see Figure 1).
 - b. Label the module slots in the "expansion chassis" (if you ordered one) as banks "3" and "4" as shown in Figure 1.
 - c. Label the cable panel with stick-on numbers as shown in Figure 1 ('3' and '4' are not used if there is no expansion chassis).
2. Label the eight mini-SAS cables (halve the numbers if no expansion chassis):
 - a. Label four mini-SAS cables with yellow dots on both ends. Position the dot on the right side of the connector shell when connected to a Mark 6 disk module front-panel connector (see Figure 1 and Figure 3: Disk-module labeling and mini-SAS cable connections; color codes must match. similarly, label the other four cables with red dots on both ends.
3. Install the mini-SAS cables into the cable panel:
 - a. Remove the four grommets from the cable panel.
 - b. Insert two mini-SAS cables (one 'yellow' and one 'red') into each grommet (populate only positions '1' and '2' if there is no expansion chassis). You may want to install the cables so that all the manufacturer-installed wrap-around cable labels are either in the front or rear (personal choice).
 - c. Re-install the grommets into the cable panel.
 - d. Mount the cable panel into the rack.
4. Connect the mini-SAS cables to the disk interface cards:
 - a. Connect the mini-SAS cables to the host bus adapter (HBA) cards on the back of the system chassis as shown in **Error! Reference source not found.** It may be also useful to apply corresponding yellow and red dots near the rear-chassis connectors if space is available.
 - b. Note: Failure to connect the mini-SAS cables properly to the HBA cards will cause the Mark 6 software to improperly label installed modules.



Figure 2: mini-SAS cable connections to host-bus adapter (i.e. disk interface) cards on rear of system chassis. Numbers correspond to cable tray labeling. 'R' is for red-labeled cables, 'Y' for yellow-labeled cables. Positions '3' and '4' will not be used (and may not exist) if an expansion chassis is not installed. Position of 'eth0' network connector is also shown.

Mark 6 disk-module labeling and connection

Label each Mark 6 disk module with a yellow dot above the upper front-panel connector and a red dot below the lower front-panel connector (see Figure 3). When installing a Mark 6 disk module, the two mini-SAS cables with the corresponding slot number (as labeled on the cable tray) are connected to the disk module and corresponding connector colors must be matched.



Figure 3: Disk-module labeling and mini-SAS cable connections; color codes must match.

The Mark 6 disk-module numbering convention is the same as Mark 5 except an asterisk ('*') is used as the separator between the alphabetic disk-owner field and module serial number¹. The barcode is standard Code 3 of 9.

Ethernet connections

Communication and control

The normal 1G Ethernet control/communications cable is connected to the left-most network connector on the rear panel (see Figure 2), normally labeled 'eth0'; the connector labeled 'eth1' is normally unused. [Note that the initial boot-up will not use any Ethernet connection (see next section).

Data connections

Each of the two Myricom dual 10GigE Ethernet Network Interface Cards (NIC) includes either two copper 'CX4' plugins or two optical 'SFP+' plugins, depending on what you ordered. The four 10GigE NIC interfaces are initially statically configured as Eth2, 3, 4 and 5 with private IP addresses 192.168.1.2-5. These IP addresses may be changed after initial boot-up.

Monitor and keyboard

You will need a monitor and keyboard for the initial boot-up. A monitor may be connected to either the standard VGA or DVI video connectors on the rear panel. A keyboard and (optional) mouse may be connected to one of the rear-panel USB connectors.

¹ Originally, an underscore character ('_') was chosen as the separator character, but the underscore cannot be represented in the Code 3 of 9 barcode.

Initial Boot-Up

Before booting up your system, please contact Chester Ruszczyk (781) 981-5951 at Haystack for the root and oper passwords. When you are ready to power up your system for the first time, please insure that no disk modules are inserted:

1. Power on the system by pressing the power button on the front of the Mark6. The boot up sequence will be displayed; please observe the start up in case there are issues. Note that the services MTA, NTP and exim4 require the network to be operational and will take time to finish. The exim4 ALERT "failed" is due to network addressing problems and is not critical. After the network is properly configured, it will go away (please be patient☺). Upon successful boot up you will see a login prompt "Mark6-4xxx login:".
2. Log on as root.
3. Change the root password using the "passwd" command.
4. Update the Ethernet IP addresses to match your needs by editing /etc/network/interfaces. The editors available on your system are vim, vi, emacs, nano, and pico.
5. Bring down the eth0 interface with "ifdown eth0", then bring the network interface up with "ifup eth0". Verify configuration with "ifconfig eth0".
6. After the network interface change, please update /etc/hosts and /etc/resolve.conf file.
7. Verify that you can communicate to the outside world by ssh'ing to a machine at your facility.
8. Update your installed Linux distribution using "apt-get update" and "apt-get upgrade" commands. The Linux kernel image will be updated in the upgrade and you will reboot your system after step 13.
9. There was a package omission in the original build sent to Conduant; please also add the lsscsi packaged: "apt-get install lsscsi"
10. Create and edit the file /etc/hardware_id with the serial number of the system chassis. The serial number can be found on the back of your system chassis, e.g. Mark6-4008.
11. If you purchased an expansion chassis, edit /etc/hw_exp_id, and add the serial number e.g. Mark6-5008.
12. Change the hostname on your system using the command "hostname newName", e.g. hostname Mark6-4008 and update the file /etc/hostname.
13. Remove the panic log for the exim4 service "rm /var/log/exim4/paniclog"
14. Reboot your updated Linux OS distribution using "reboot".
15. At the login prompt, log in as root with your new root password.
16. From the Mark6 website <http://www.haystack.mit.edu/tech/vlbi/mark6/software.html>, find the latest version of the Mark6 software suite. The packages you will have to download from the site are cplane, dplane, Pynetinfo, and mark6-utils. The official packages will be in the form package_ver_amd64.deb. Download and install the latest Mark6 software packages: dplane_ver_amd64.deb, python-cplane_ver_amd64.deb, and mark6-utils_ver_amd64.deb.
17. Using dpkg install the packages in the following order:
 - a. dpkg -i python-pynetinfo_ver_amd64.deb
 - b. dpkg -i python-cplane_ver_amd64.deb
 - c. dpkg -i cplane_ver_amd64.deb
 - d. dpkg -i mark6-utils_ver_amd64.deb
18. Your system is now updated and configured with the latest Mark6 software.

Your Mark6 system comes with two default logins, as shown in the following table:

LOGIN NAME	PURPOSE
root	This account has complete access to your system. Normally used only to perform system administration tasks.
oper	This account is configured to allow you to easily execute the Mark6 programs.

Setup and perform Mark 6 self-test

The Mark6 self-test verifies that the Mark6 software suite and hardware components are operating properly. A Mark 6 disk module is required to run the Mark6 self test; if you do not have a disk module, you will have to skip this step.

A summary of the steps for the self-test is: 1) start up Mark6 software, 2) insert and a disk module, connect the e-SAS data cables, and apply power to the system, 3) initialize the disk module, 4) connect the network cables for a loop-back test, and 5) run the self test. A separate memo with complete details of this operation is available under the Mark6 section of the haystack website.

Additional information resources

Other documentation for the Mark 6 system, including the user's manual and usage examples, is available from the Haystack Observatory Mark 6 website:

<http://www.haystack.mit.edu/tech/vlbi/mark6/index.html>

For Mark 6 documentation, click on 'Mark 6/Documentation' on the left side of the page.

Your system has been loaded with Debian GNU/Linux version 6.1, codename "Squeeze". Documentation on this operating system is available at the Debian website

<http://www.debian.org/doc/manuals/reference>

Your Mark6 system comes configured with a static IP address for eth0. You will need to change the address based on the policies of your institution (static, or dynamic). A good reference for configuring the network interfaces on your Mark 6 system is located at the Debian website

<http://www.debian.org/doc/manuals/reference/ch-gateway.en.html>

For questions about accounts, logins, or passwords, please contact Chester Rusczyk at <chester@haystack.mit.edu> or phone at +1-781-981-5951. For security, you should change the passwords on these logins. For information on creating and modifying accounts, refer to the Debian wiki website <http://wiki.debian.org/UserAccounts>. You can also change passwords using the passwd command.

For general questions about the Mark 6 system, please contact Alan Whitney at awhitney@haystack.mit.edu. For software questions, contact Roger Cappallo (rcappallo@haystack.mit.edu) or Chester Rusczyk (chester@haystack.mit.edu).