

MMTO Internal Technical Memo 93-2

Remote Observing with the MMT

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1. Introduction

This brief set of instructions should help you to get started using the MMT Remote Observing System with the Red or Blue Channels of the MMT Spectrograph. It is written assuming that you are working from the MMTO Remote Observing Room, room 481, Steward Observatory. A key to this room can be checked out from the MMTO Business Manager, Howard Lester. It would be prudent to check with me, Frank Sharp, Dave Ouellette, or some other MMTO staff member a day or so before your run so that we can ensure that all systems are working and brief you on the operation of the video switcher and the details of audio communication with the Telescope Operator.

2. Audio Communication

There is a desk-mounted microphone in Room 481 connected to a small box which is also connected to a speaker. The box has a power switch, a pilot led (marked '12V'), a volume control, a three-position toggle switch and a black button. The microphone also has an ON/OFF switch. A duplicate system is located in the MMT Control Room.

To operate the system, turn on the power switch and make sure that the microphone switch is on. Call the MMT and request that the system be turned on up there. The three-position toggle gives you the option of turning your microphone on at all times, off, or making it a 'push-to-talk' mike (in the 'Switched' position). In the latter state, the small black button must be depressed to energize the microphone. In practice, it is fairly easy to find a combination of speaker and microphone position and volume setting to allow both the Remote Observer and Telescope Operator's mikes to be 'On' at all times, allowing conversation in civil tones.

3. Telephones

There are three telephones in room 481. One of these (670-5732) is an FTS line; one is connected to the mountain extension 621-7933; and the third is a normal UA extension (621-3953). The 7933 line will ring in the Remote Room as well as on the mountain. In general, *do not answer it*. It will be answered on the mountain. If you *need* to make a long-distance call, say, to a collaborator in Ulan Bator, use the FTS line, dialing 9-1 before the area code and number. *Do not abuse this phone line. We know who you are!*

4. Spectrograph Control

Spectrograph control is accomplished using a commercial product called NPA which allows a PC running PC-NFS to accept input from and direct output to a window on a networked Sun. To set up the system,

1. Have someone at the MMT reboot the spectrograph control computer in 'REMNET' mode. They will know what you mean.
2. Have the same person switch the toggle switch on the Observer's Top Box paddle to 'SCCS Mode'
3. Select 'SCCS' (recommended) or 'Big SCCS' from the 'Windows' sub-menu of the Workspace pull-down menu.
4. You will soon be presented with a window displaying the PC screen. Type BCCS, RCCS, or RCX, for the Blue Channel, Red Channel, or Red Channel with Focal Plane Adapter, respectively.
5. When the program has initialized, enter the command TOP ON to enable control of the Top Box.

Ian Scott-Fleming has written a detailed memo on the use of this system. A copy should be located in the Remote Room or you can get a copy from him.

5. Using the Data Acquisition System

In what follows, I will assume:

1. You are working from the MMTO Remote Observing Room, room 481, Steward Observatory.
2. You are familiar with IRAF and ICE, the IRAF-based data acquisition package.
3. You are familiar with an editor and can create and edit files in an IRAF or Commandtool window.

The Sun Sparcstation 1 which you will be using is called `ross`. The Sun 4/370 instrument computer at the MMT is called `mmt`. Before you can log into the system, you must determine what the passwords are for the user `mmtobs`. Ask me, Dave Ouellette, Dennis Smith, or Wayne Peters. In general, the passwords on `mmt` and `ross` are different. `ross` shares its password with all of the other downtown machines through the password distribution system on `astro`, but not with `mmt` or `harrison`. *Please do not change either of these passwords!*

5.1 Logging On

Log on to `ross` in room 481 as user `mmtobs`. Create any new windows that you would like from the 'Windows' submenu of the Workspace menu.

Now remote log in to `mmt` from within the IRAF text window. Use `rlogin mmt` to do this. You will be asked for a password. Obviously, enter the password for `mmtobs` on `mmt`. If you want two IRAF windows, like you would have at the telescope, create another IRAF window and `rlogin` to `mmt` from it as well. Make sure that you have an SAOimage window either open or iconized.

5.2 Setting Up .irafhosts Files

In order to facilitate the communication between `mmt` and `ross`, make sure that files called `.irafhosts` exist on both machines. These give username and password information which allows the sharing of resources between the two machines.

The format of the files is quite rigid. Normally, the state in which you find them will be fine, but you should examine their contents to be sure.

The files start with a number of comment lines starting with the character #. Thereafter come four lines starting with port, auth, hiport, and timeout. Leave them alone. Following these are lines giving username and password information. Edit the file if necessary so that the last two lines of the file on mmt read:

```
harrison.as.arizona.edu : mmtobs <user>
* : mmtobs ?
```

and on ross:

```
mmt.as.arizona.edu : mmtobs ?
* : mmtobs <user>
```

You may be prompted for a password on one or the other machines when you first try to display a frame or copy files, but this should only happen once.

5.3 Mass Storage of Data

By default, you will store your data on the mmtobs directory on /u3m on mmt. Data can be written to the 9-track, DAT, or Exabyte tapes on mmt. You will have to ask the Telescope Operator to mount the tapes. Alternatively, you can write onto one of astro's tape drives by allocating the drive (e.g. allocate astro!mta) and writing to it directly. You can also copy files over the network by imcopying them to a disk on ross or astro and then writing them from there.

Alternatively, you can use wfits to create FITS disk files and then ftp them to your home directory. This is probably the most straightforward option.

To imcopy over the link, first open another IRAF window on ross from within the Shells submenu of the Root Menu. In this window, get into the directory into which you want the data copied. Then use imcopy to move the data you want from mmt. For example, suppose the data are stored in mmt!/u1m/mmtobs/night1, To copy all of the data therein to ross's SCSI, type the following into an IRAF window running on ross:

```
cd /u2r/mmtobs
imcopy mmt!/u/mmtobs/night1/*.imh .
```

Copying over the link via ftp or imcopy is a lot faster than writing an Exabyte FITS tape.

6. Remoting the Display with xmx

A frequent request from users of the remote system is to have a collaborator in the Remote Observing Room during the observations, "looking over the shoulder" of the observer on the mountain. Skip Schaller has located and installed public-domain software which facilitates this by causing a copy of mmt's display to be sent to a remote Sun. This has been successfully used by several observing teams.

In order to remote the display, follow the litany below *exactly*. Note that both Suns must be Steward-administered machines. This class includes mmt and ross and the machines served by nelson, as well as those served by astro and qso. For the sake of this example, assume that you are user mmtobs, logged in to mmt and you want to remote your display to ross. To do this with other machines, substitute the name of the local machine for mmt and the remote machine for ross is that which follows.

1. Log in to mmt.
2. From an Xterm or cmdtool window, rlogin to ross as mmtobs.
3. Edit the file .rhosts in /u/mmtobs on ross to include a line that reads:
mmt.as.arizona.edu mmtobs
4. Logout from ross. Check that you have rsh access to ross using the command rsh ross whoami. It should reply with mmtobs.
5. Create a file in mmtobs' home directory on mmt called .xmxslaves.mmt containing the name of the remote machine. In this case, ross.
6. Ensure that no one is logged on to ross' console.
7. Log off mmt and log on again. You will get an error message, ignore it. The initialization may appear to take a little longer than necessary. This is because the screen information is also being sent to ross.
8. At this point, everything that appears on mmt's console also appears on ross. All input from ross is disabled, though movements of ross' mouse will move the mouse cursor on ross' screen.
9. Subsequent logins to mmt as mmtobs will also send the screen to ross if no one is logged on there. Therefore, if you want to disable this feature, delete the file .xmxslaves.mmt.

10. *Before you log out of mmt at the end of the run, be sure to delete the file .xmsslaves.mmt.*
11. When you log off mmt, ross' screen will blank until a carriage return is hit on ross' keyboard. Then the ross login prompt will appear.

Note that the software that accomplishes this magic, xmx, is not supported by the Steward Computer Support Group, so you use it at your own risk. If this feature is used often, we can work out a way to make its use more transparent. Send me your comments on it.

7. Miscellaneous Stuff

1. The default laser printer for ross is nelson's (i.e. lw13, the laserwriter in room 471). If you can't get access to that room, use astro's (lw1). You can then set the environment variables printer and stdplot to lw13 (e.g. set stdplot = lw1).
2. When you are done observing, please make sure that duplicates of your log sheets are sent to the mountain. Get copies either to me, Dave Ouellette, or Dennis Smith.
3. *Attention Southpaws:* You can interchange the mouse and keyboard cables on the underside of the keyboard if it makes you more comfortable. If you get a message stating Type b (boot), c (continue), or n(new command mode) enter a 'c' and then choose 'Refresh' from the 'Utilities' submenu of the Workspace Menu.