An LRIS System Operations Sourcebook

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0.1 Introduction
The purpose of this manual is to document miscellaneous procedures that are too short to warrant manuals of their own, procedures such as system start up, shutdown and the building of the entire software system from scratch.

0.2 LRIS Startup
The following procedure is used to start up the LRIS and it’s software:

1. Apply power to the spectrograph controllers and encoders.
2. Apply power to the spectrograph CCD electronics.
3. Make sure the LRIS instrument workstation is up. No LRIS specific software must be running, but the system must be up for VxWorks to boot on the VME systems.
4. Run Open Windows from the instrument workstation.
5. Select from the Open Windows menu, LRIS Tools, either “Startup LRIS” or “Startup LRIS No DCS” depending on whether you wish to run the DCS or DCS simulator along with the LRIS. This spawns the MUSIC tasks for network communications and the image reading and display software.
6. Apply power to the CCD and motor control VME crates. This loads VxWorks.
7. On the motor control VME console type `<liris_startup.vxworks` to load and initialize the LRIS VME motor control software.
8. On the CCD control VME console type `<ccd_startup.vxworks` to load and initialize the CCD control software.
9. On the CCD control console:

   Type tdl 0,2 to test the fiber link to the timing board on camera 0.
   Type tdl 0,3 to test the fiber link to the utility board on camera 0.
   Run the program cbv to change the camera bias voltages if you are not happy with the defaults.
   Type sbv 0 to apply the bias voltages. This must be done regardless of whether or not you changed the default bias voltages.
0.3 LRIS Shutdown

The following procedure should be followed to completely shut off the LRIS:

1. Close the trapdoor (modify trapdoor=closed).
2. Switch off all reference lamps (lamps_off).
3. Switch off power to the spectrograph.
4. Switch off power to the both VME systems.
5. Select “Shutdown” from the “LRIS Tools” menu on the instrument workstation.
6. Exit OpenWindows on the instrument workstation.

0.4 Building the System from Source

The best way to build the LRIS control software system on a new computer would be to tar the old system (the /lserv directory tree), copy the tarfile to the new system, untar it there, recompile, relink and remake the libraries on the new system.

The following is a checklist for creating the LRIS software:

1. Create the /kroot directory tree. This should be done automatically for you when you retrieve the source files via tar.
2. Execute make in the following directories:

   [ ] /kroot/kss/lris/tasks/watchccd to create the watchccd tasks.
   [ ] /kroot/kss/lris/tasks/readccd/writeimage to create the file and tape image functions.
   [ ] /kroot/kss/lris/tasks/readccd/readccd to create the image server.
   [ ] /kroot/kss/lris/fiord to create the FIORD library.
   [ ] /kroot/kss/lris/vme/cserv_common to create the VME control server.
   [ ] /kroot/kss/lris/vme/lserv to create the LRIS motor control subsystem.
   [ ] each of the individual stage directories in /kroot/kss/lris/vme/lserv/shell to create the stage test programs. This is not necessary for the normal operation of the LRIS.
   [ ] /kroot/kss/lris/vme/lbserv to create the LRIS CCD control system.
   [ ] /kroot/kss/lris/vme/lbserv/shell to create the CCD test programs.
   [ ] /kroot/kss/lris/vme/readccd to create the LRIS VME CCD image server.
   [ ] /kroot/kss/lris/vme/music/dlib to create the VME MUSIC library.
[ ] /kroot/kss/lris/vme/music/traffic to create the VME traffic object files.
[ ] /kroot/kss/lris/vme/mlog/src to create the error logging object files.
[ ] /kroot/kss/lris/vme/util/src to create the VME utility object files.
[ ] /kroot/kui to create the use interfaces.
[ ] /kroot/ktl to create the Keck Task Library.
[ ] /kroot/kss/aut to create the autoguider subsystem.
[ ] /kroot/kss/dcs to create the DCS interface.

Eventually there will only be a single makefile in /kroot. A make command in this directory will create the objects, libraries and tasks for the entire system.