

A Quick Guide to the New Coudé Feed Control System

by Kim Gillies, D'Anne Thompson, and Caty Pilachowski

1. Introduction

The new coude feed telescope control system is similar in architecture to the 2.1m system. Two computers replace the old 11/24 DEC computer running under Venix which has been operating the feed since 1987. The new computers are [Iris](#) and [Lisa](#). A third computer ([Indigo](#)) operates the CCD and gives access to IRAF data reductions. The advantages of the new system are

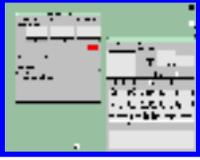
1. . much improved pointing and tracking,
2. . a graphical user interface which we hope will be easier to learn and faster to use,
3. . better access to star caches and catalogs,
4. . compatibility with other telescopes on the mountain,
5. . better maintainability.

In addition to the graphical user interface, the new telescope also includes a "[feed emulator program](#)" which allows you to run the telescope by typing in the same commands used in the old Venix operating system. You may choose to use either the graphical interface or the command line interface.

2. How to Make It Work

When you arrive in the coude feed control room Lisa's console should be up and running. We now recommend that the telescope control system be left running during the day.

...

After you login, the computer system will automatically load the telescope control system and open two windows, one for telescope control and one for access to the "star caches" or coordinate files. These two basic windows should be open throughout the night, but additional windows will pop up as needed. The screen layout  includes a third window for entering typed commands.

To work in a window, move the mouse's [pointer](#) to within that window. In the window are "buttons," boxes for displaying information, and fields for entering information. The mouse is used to control most of the action on the screen. Generally, the [left button](#) on the mouse is used to "push" a button on the screen, and the [right button](#) is used to access and select menus. To "push" a button, move the mouse's [pointer](#) onto that button and [click](#) the left (select) button on the mouse. To enter information into the program (e.g. the wavelength setting for the grating) move the mouse's pointer to the line for the information you want to enter, and then type in the appropriate number or character string. If the task calls for entering several fields (e.g. adding a new star to a star cache) the carriage return will automatically move you to the next field. Note the most windows contain a "close," "cancel," "quit," "exit," "enter", or "ok" button to exit and close that window.

With that brief introduction, choose where you want to go next.

- [The Main Telescope Control Window](#)
- [Opening Up the Telescope](#)
- [Typical Observing Procedures](#)
- [Setting the Grating](#)
- [Stowing the Telescope](#)
- [Using the On-Line Help](#)
- [Shortcuts](#)
- [Problems](#)

Thanks for your Help

It isn't too late to make changes in the new system. Please let us know of any items that seem awkward, slow, or confusing. Have we left out any functions that you consider important for efficient observing? Have you run into any problem or bugs? Let us know, and maybe we can fix it!

Software

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The computer Iris

[There should be a picture here].

Iris is a Heurikon single board computer in a box from the same manufacturer. This Heurikon box also contains computer boards that interface to the telescope control hardware. The software is based on VxWorks.

The terminal Lisa

[There should be a picture here].

Lisa is an NCD X Terminal and is used for the user interface.

The computer Indigo

[There should be a picture here].

Indigo is a Sun SparcStation with memory and disks and fans and all that other stuff that make IRAF possible.

The Command Line Interface

If you prefer to use a command line interface rather than a graphical interface, move the mouse to a blank portion of the screen and hold down the RIGHT mouse button. Slide the mouse down until "programs" is highlighted, and then drag the mouse to the right to open the programs sub-menu. Slide the mouse down until "Feed Emulator" is highlighted, and then release the mouse button. A new window will open within which you can type commands. You must then type the command "tinit" in command line window to get the telescope initialized. This can be done while you are already observing. We alert you that this emulator program is not yet fully tested. The command line interface is NOT integrated with the main telescope control window, so the commands you type will not show up in that display.

The command line interface uses the same commands we have all grown to know and love at the feed over the last several years (robject, bstar, rff, preset, gon, stow, etc.). These commands are documented in the coude feed manual and in the old control system manual available in the control room.

Control-S shortcut

Coude Feed TCS Control

Open/Stow... (^S) Grating... (^G) Offsets... (^O) System... (^Y) Quit

Telescope Positions

| | | | |
|-------|-------------|--|--|
| name | 53 102 | | |
| ra | 00:36:08.20 | | |
| dec | 54:10:07.0 | | |
| epoch | 2000.0 | | |

next current last

edit_next go there **not ready**

Guider: off z **status** tel_info help Set Values ▾

Status messages

```
Please wait while TCS connection is made.
Attempting to open TCS on 'iris.kpno.noao.edu'.
This can take up to 60 seconds.
The connection was successful. Observe!
```

Meta-S shortcut

The Telescope Control Window

xoe

Caches

Caches
 Yale Bright Stars
 Radial Velocity Stds
 SAO Stars
 Almanac Bright Stars

Selected Object

number 142

name +53 102
 coord 00:36:08.20 +54:10:07.0 2000.0
 p.m. +0.020 +0.000
 comment 5.10 B7III

send next get current next & go

search from selected search... add new objects edit selected save selected in cache

cache: Yale Bright Stars

| | | | | | | | | | | |
|-----|-----|-----|-------------|-------------|--------|--------|--------|------|--------|----|
| 131 | +26 | 76 | 00:32:34.40 | +27:34:50.0 | 2000.0 | -0.020 | -0.010 | 6.70 | A2IV | 00 |
| 132 | +27 | 84 | 00:32:49.00 | +28:16:49.0 | 2000.0 | -0.010 | +0.010 | 6.30 | K0III | 00 |
| 133 | +54 | 101 | 00:33:10.30 | +54:53:42.0 | 2000.0 | +0.070 | -0.040 | 5.90 | K0III | 00 |
| 134 | -63 | 52 | 00:32:43.80 | -63:01:53.0 | 2000.0 | +0.090 | -0.030 | 5.10 | A0V | 00 |
| 135 | +65 | 70 | 00:34:24.80 | +66:45:02.0 | 2000.0 | +0.020 | +0.010 | 6.50 | B9III | 00 |
| 136 | -30 | 156 | 00:33:41.00 | -29:33:30.0 | 2000.0 | -0.030 | -0.030 | 5.60 | K2III | 00 |
| 137 | -71 | 20 | 00:33:23.40 | -71:16:00.0 | 2000.0 | +0.080 | -0.020 | 6.10 | A7IV | 00 |
| 138 | -53 | 117 | 00:34:27.70 | -52:22:24.0 | 2000.0 | +0.220 | +0.040 | 5.60 | F3IV-V | 00 |
| 139 | +12 | 57 | 00:34:55.20 | +13:22:16.0 | 2000.0 | -0.090 | -0.050 | 6.40 | K0 | 00 |
| 140 | - 4 | 62 | 00:35:14.80 | -03:35:34.0 | 2000.0 | +0.410 | -0.020 | 5.20 | F8V | 00 |
| 141 | - 1 | 68 | 00:35:32.70 | -00:30:20.0 | 2000.0 | +0.130 | -0.060 | 5.90 | F5IV | 00 |
| 142 | +53 | 102 | 00:36:08.20 | +54:10:07.0 | 2000.0 | +0.020 | +0.000 | 5.10 | B7III | 00 |
| 143 | +12 | 59 | 00:35:54.70 | +13:12:24.0 | 2000.0 | -0.140 | -0.180 | 6.40 | F7V | 00 |

top previous page next page bottom

history

```
142 +53 102 00:36:08.20 +54:10:07.0 2000.0 +0.020 +0.000 5.10 B7III 0 0
```

The XOE (Star Cache) Window

Type 'q' to remove this image



Mouse Basics

In Xccs, you'll use the mouse for many basic operations. Here are some definitions for terms that are used in describing the mouse and its use. These terms are used throughout the help system.

The Mouse

The mouse is the small box with three buttons attached to the NCD terminal. It is typically found to the right of the terminal. The mouse with the NCD terminal does not require a special pad-the desktop works fine.

The Pointer

The pointer allows you to interact and operate the Coude Feed through the Xccs graphical user interface.

The pointer is the indicator on the screen that shows the current location for mouse activities. When you move the mouse on the mouse pad, the pointer moves on the screen. The pointer shape is the shape of an arrow.

The Mouse Buttons

Help assumes the use of a right-handed mouse, with the mouse buttons in the sequence SELECT, ADJUST, and MENU, from left to right.

Left Button or SELECT

SELECT Button Selects items on pop-up windows, chooses default menu items, and selects GUI items in the main TCS window.

Middle Button or ADJUST

ADJUST Button The adjust button is not used in the TCS GUI.

Right Button or MENU

MENU Button Displays menus, submenus, and pop-up menus, and chooses items from menus.

Mouse Button Activities

Standard mouse button activities are clicking, pressing, and dragging.

Click

Press and release the designated mouse button quickly. To "double-click," press and release the designated mouse button twice quickly.

Press

Press and hold down the designated mouse button.

Drag

Press the designated mouse button, hold it down while moving the mouse, then release the button.

The names of the buttons (SELECT, ADJUST, and MENU) and the kinds of mouse activities (click, press, and drag) will be used throughout other parts of the help system.

The Main Telescope Control Window

The main telescope control window provides access to the most important telescope functions (including slew to a new star and guider on/off!). The layout of the main telescope control window is shown in Figure 2. Across the top of the telescope control window are several buttons for accessing telescope control functions. These include opening and stowing the telescope, setting the grating, offsetting the telescope, accessing the telescope computer (Iris), and quitting the program. To invoke any of these functions, just move the mouse pointer to the button and click the left button on the mouse.

Below these buttons are three boxes which contain the coordinates of the current object, the next object, and the last object to be observed. Below each is a button to select that field as "active." If you move the mouse pointer to the "go there" button and click the left mouse button, the telescope will immediately move to the coordinates in the active box. This allows you to move the telescope quickly among three positions. Also included in this window is a button ("new next") to enter object coordinates directly, bypassing the star cache window.

The next set of buttons in the telescope control window turn the guiding off or on, allow you to re-zero the telescope coordinates after placing a star on the spectrograph slit, change the guiding and tracking rates, or get help from the on-line help facility. Just click the mouse on the appropriate button. The window also contains an "idiot light" to warn you if something has gone wrong (oil pumps not working, etc.). The light will be green and "ready" if the telescope is functioning and red and "not ready" if the telescope needs to be reinitialized (see below) or if something mechanical has gone wrong.

To change the tracking or guiding rates, move the pointer to the "Set Value" button and hold down the right button on the mouse. Slide the mouse down to the choice you want (say, "Set track rates") and release the mouse button. A new window will open in which you can type the rates you want. Click the left mouse on the "default" button to restore the default rates. Click on "enter" or "cancel" to close the window. Finally, the bottom of the main window is devoted to status messages.

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Opening Up the Telescope

A TA should open the shed on the roof; turn on the main power for the telescope on the console in the slit room, if it isn't already on. Now click the mouse on the "open/stow" button in the main telescope control window. Another subwindow will open showing the [status](#) of the telescope and its various parts. Check that the

- system power,
- shed,
- oil pumps,
- drive alarm,
- and panic stop

status indicators in the "open/stow" window are *green* (tower door and autoenable should be red). Click on the "open" button to unstow the telescope. If you want the door of the [#2 mirror](#) in the tower to remain closed, (it should be open for observing!) click the mouse on the little box indicated in the window for this purpose before you unstow the telescope. When the telescope is open (i.e. ready to slew to a star), a comment will be added to the status box in the main window. This should happen almost immediately after you click the "open" button. The open/stow window may be closed by clicking on the "close" button in the lower right corner (this does NOT close the telescope!)

The telescope does not need to be in the stow position to start up the tcp program or restart the tcp computer (Iris). But every time the program or the computer is restarted or a drive alarm trips, you MUST reinitialize the telescope by clicking the mouse on the "open" button in the "open/stow" window.

To find a bright star near the meridian, follow the steps listed under "find a star near an approximate position" in the section on using the star cache window. Now set the "next" field in the main telescope control window to active, and click the mouse on the "go there" button. The telescope will slew to the bright star's coordinates. The star should appear on the TV; if not, you may have to check the eyepiece in the slit room. Center the star on the slit with the handpaddle. (Note that the hand paddle will be set to "set" speed after every preset.) Once a setup star is centered on the slit, you can zero the telescope coordinates by clicking on the ["z" button](#). The "z" button should be used only when you are very confident of your coordinates.

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Typical Observing Procedure

Once the telescope is up and running, a typical observing procedure might be as follows:

1. . While the CCD is integrating, select the next object to be observed from one of the star caches available in the star cache window. Send the star to the "next" box in the main telescope control window with the "send next" button.
2. . When the CCD begins to read out, make sure the "next" box in the telescope control window is active, and click the mouse on the "go there" button in the telescope control window. The guider will turn off automatically when the "go there" button is clicked.
3. . When the slew is complete, center the star up on the slit with the handpaddle.
4. . Click the mouse on the "guider" button to turn the guider on.
5. . When the CCD readout is complete, start the next integration.

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Setting the Grating

Often the first task confronting an observer is to set the wavelength of the grating, or to confirm that the grating is set correctly. To open the [grating window](#), move the mouse to the "grating" button at the top of the telescope control window, and click the left mouse button. The grating window will appear. You will then need to select the appropriate

- [camera](#),
- [grating](#), and
- [collimator](#),

by moving the mouse pointer to the proper button and again clicking the left button on the mouse. Set the

- [grating order](#)

by moving the pointer to the line for the grating order and typing in the order you want. Select the

- [units](#) (encoder or wavelength)

for the grating tilt, and then enter the encoder or wavelength

- [value](#)

you want by clicking the left button of the mouse near the input field. Move the pointer to the line for desired wavelength or encoder value, and type in the number you want.

Turn on the grating drive motor in the electronics rack and click the mouse on the "set grating" button to tell the grating to move. After the grating has moved to the correct setting, turn off the power to the grating drive. The grating's position (wavelength and encoder units) is displayed in a box in the upper right corner of the [grating window](#). The reciprocal dispersion, calculated from the camera and grating selected, also appears in the grating position box. The grating window also has buttons for nudging the grating up or down by a specified number of encoder units.

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Stowing the Telescope

In the main telescope control window, click the mouse on the "open/stow" button, then click the mouse again on the "stow" button in the window that pops up. You can then close the setup window with the "close" button. When the telescope is stowed, a message will appear in the status message field in the main telescope control window. Turn off the system power on the panel by the slit, and ket the 2.1m operator know that he or she can close the shed. Please leave the telescope control program running. There is no need to log off of Lisa.

Note that if you do quit and reopen the TCS window, you must also quit and reopen the star cache window, or object coordinates will not transfer from the star cache window to the TCS window.

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Using the On-Line Help

In the main telescope control window is a button labeled "Help." Clicking the mouse on this button will open a new window giving access to several screens of information describing the control system and how to use it. On the right side of the window is a list of topics. Click the left mouse button on the one you want to read, and the text will appear in the window. Of particular value are the texts for ["Mouse Basics"](#), ["Using the Mouse"](#), and ["The Main Window"](#). On the far right side of the window is a scrollbar to move within the text. Click the left mouse button on the downward pointing arrow to move down the text. Use the "close" button at the bottom to exit this window. Note that the "help" files are not yet complete - we're working on it!

A second form of on-line help is available using the "Help" or "F1" key on your keyboard. Position the mouse pointer on the item about which you want more information, and type the key. If further information is available, it will be shown in the new window that opens up. To close this help window, click the left mouse button while the pointer is on the "push-pin" in the upper left corner of the window.

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Shortcuts for Confident Users

The star cache program is written with a number of "shortcuts" to speed up operations once you have mastered the basics. These include:

1. . "Double click" the mouse on a star cache name to select and open it. A listing of the cache will immediately appear in the display portion of the window.
2. . Double click the mouse on a star in the display portion of the star cache window, and that star will appear in the "selected" portion of the window and the coordinates will be sent to the box for the "next" star in the main control window.
3. . Typing the "F3" function key on the terminal will cause the program to search for an Almanac bright star near the one currently "selected" in the star cache window. The F5 key will search the currently selected cache for stars near the selected position.
4. . In all of the star cache subwindows, typing "shift/carriage return" at the last text entry will send it off to do whatever you have asked.

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Problems and Possible Solutions

What If My Star Is Not There?

... If you aren't experienced at this, call a TA!

What Else Could Go Wrong?

We don't have a lot of experience yet with the new control system so it is hard to predict what might go wrong. Of course, we've tried to identify all the bugs we can, and fix them. But one problem that occurs occasionally is that the star cache window will suddenly disappear. You can get the window back by moving the mouse to a blank portion of the screen and holding down the [RIGHT mouse button](#). Slide the mouse down until the "programs" line is highlighted. Slide the mouse to the right until the programs submenu opens, then drag the mouse down to highlight the program you need to reopen. "X TCS Tool" is the main control window, "X Star Cache Tool" is the star cache window, and ["Feed Emulator"](#) is the command line interface. Release the right mouse button, and the window should reappear.

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The TCP computer ([Iris](#)) can be restarted using the "restart" button in the "Systems" window, but only if the link is working. The "test link" button will tell you if the link is working. If the link isn't working, try reopening the link with the "open link" button in the "Systems" window. If Iris and the link are no longer responding, Iris can be restarted with a real button on the front of the Heurikon box in the computer room downstairs. Ask a TA! Restarting Iris takes about a minute, either way. After restarting Iris, you must open the "open/stow" window and click the mouse on the "open" button. Please let us know if you encounter circumstances requiring you to restart Iris.

If things don't seem to be working, check the message portions of the windows. Error messages from the telescope may also appear at the bottom of the VDU screen. We would also appreciate knowing, as best you can remember, what was going on when something went wrong.

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If we had a picture, this is where it would go!