Z System-Dependent AIPS Tips

This appendix has not been updated in some time other than some technical corrections. The information contained herein should be indicative of conditions, but not correct in detail. This is particularly true of the Charlottesville and Green Bank information.

Although AIPS attempts to be system independent, some aspects of its use depend inevitably on the specific site. These vary from procedural matters (*e.g.*, assignment of workstations and location of sign-up sheets, tape drives, and workstations or other terminals) to the hardware (*e.g.*, names and numbers of workstations and tape and disk drives) to the peculiar (*e.g.*, the response of the computer to specific keys on the terminal, the presence of useful job control procedures). This appendix contains information specific to the NRAO's individual AIPS installations. It is intended that non-NRAO installations replace this appendix with one describing their own procedures, perhaps using this version as a template. The general description of using AIPS on workstations was given in Chapter 2 and will not be repeated here.

Within the NRAO, AIPS is installed on two main architectures — Linux PCs and Mac workstations. All our old SUN, IBM RS/6000, CONVEX C–1 and DEC VAX 11/750 and 11/780 systems have been decommissioned. Currently the fastest AIPS machines in the Observatory are the whichever PC was bought last.

Z.1 NRAO workstations — general information

All NRAO workstations run some version of the Unix operating system, Linux on PCs and Mac OS/X on Apple products. Unix systems are intrinsically sensitive to the difference between upper and lower case. Be sure to use the case indicated in the comments and advice given in the following notes. AIPS itself is case-insensitive, however; conversion of lower-case characters to upper-case occurs automatically. (Unix systems have a variety of characters for the prompt at monitor (job-control) level, and allow users to set their own as well. We will use `$` as the prompt in the text below.)

Z.1.1 The "midnight" jobs

The versions of AIPS on all NRAO PC systems are kept up to date continually with the master versions on the Socorro Linux PC called `dave`. This is achieved by automated jobs that start running at very antisocial hours of the early morning. Any changes formally made to the `TST` version of AIPS are copied to the relevant computers and recompiled/relinked. Midnight jobs run in Charlottesville, Socorro, Green Bank, and many other sites around the world.

Z.1.2 Generating color hard copy

Z.1.2.1 Color printers

Color printers are, these days, simply printers that understand the color extensions to the PostScript language used to describe plots. The NRAO owns several Tektronix color printers, two public ones in Charlottesville (`ps1color` in the AIPS Caige and `ps3color` in the Library) and two at the AOC in Socorro (`nm-aoc212` on the ground floor and `nm-aoc324` upstairs in the former library). You may display your PostScript file on the printer in Socorro simply by typing

`$ lpr -Pnm-aoc324` *filename* C_R where *filename* is the name of your file.

The paper size is 8.5×11 inches, which is the default for *AIPS* tasks `TVCPS` and `LWPLA`. To have the file printed on transparency paper use queue `aoc324c/trans`. Full control over this complex printer is available with the `multiprint` command; type `multiprint --help` C_R for information. If you do not wish to save the plot as a disk file, you may also print it directly from within *AIPS*. The color printer is one of the printer choices when you start up `AIPS`, but you probably want to select a regular PostScript printer as your default printer. You can change your printer selection with the verb `PRINTER`; use PRINTER 999 C_R to see what your choices are and then PRINTER *n* C_R to choose the printer numbered *n*. *AIPS* print routines will re-direct PostScript files that actually contain color commands to the first `PS-CMYK` printer in the list, but will not re-direct ordinary print jobs to some printer other than a color printer.

Z.1.2.2 Software to copy your screen

To obtain a color hard-copy of what is on your screen, there are several software options you can choose. These include `TVCPS`, `xv`, and `import`. Having created a PostScript (or other format) file, you can print it on color printers at the NRAO or copy the file via e-mail, `scp`, or `ftp` to some other site.

The `TVCPS` task in *AIPS* will create a color Encapsulated PostScript file from whatever is displayed on the *AIPS* TV server (`XAS`). If you use the `OUTFILE` adverb, this file is saved with whatever name you specify (see § 3.10.1). If you specify a black-and-white output to `TVCPS`, then the output can be sent to any PostScript printer. Color PostScript must be sent to a color printer. You can, of course, edit the saved file (if you are a PostScript wizard or use HELP POSTSCRIPT) and can insert the file (since it is encapsulated) in another document.

The `xv` program is a Unix utility program available on most systems at the NRAO. It is mainly intended for image display of GIF, JPG, TIFF, and other format files. When you start `xv`, click the right button mouse anywhere in the `xv` window to bring up the control window. One of its features is a screen grab which is controlled by the "Grab" button in the lower right corner of the control window. *Before* you press this, arrange your windows and icons so that you can see exactly what it is you want to grab (*e.g.*, the `XAS` server). Now press the "grab" button. A window with instructions will appear. Move the cursor to the top left of the area you want to grab. Then press and hold down the center mouse button, and drag the mouse cursor until it is at the bottom right of the area you want to grab. As you do this, you will see a box pattern on the screen outlining the area selected. Once you are done selecting the area, release the mouse cursor. When `xv` has finished grabbing the screen, whatever you grabbed will appear in the main `xv` window. You can now use the "save" button of the control window to save this as any format you want. One nice feature of this is the "save as Postscript" option. It allows you to scale, rotate, and position the image in relation to the page. Its user interface is better than most image utilities.

Finally, the `import` program provides similar functionality to the "grab" feature of `xv`, with many options about output formats and much more. Enter import -help C_R for a summary of the options. For example, enter import -quality 100 outfile.jpg C_R. The cursor will change to a plus sign. Position it at the top left corner of the area you wish to grab, hold down a mouse button, and drag the cursor to the bottom right of the area you wish to capture. When you let up on the button, the file `outfile.jpg` will be written in `jpg` format. Alternatively, position the cursor inside the window you wish to capture and click the left mouse button. The entire window will be captured. The file extension determines the format, so `.eps` will produce encapsulated PostScript.

Z.1.3 Gripe, gripe, gripe, . . .

The so-called "designated AIP" is now Eric Greisen at all times (except when he is on vacation). He assists local and remote users with their AIPS problems, providing quick advice or simple fixes to bugs, More complex problems may require some time and may even require receipt of the user's data in order to debug the problem. Contact the designated AIP (and all members of the group) at the e-mail address `daip@nrao.edu`. The "my.nrao" web portal lets you into the "helpdesk" which has an AIPS department. Management prefers if you use this approach to request assistance.

Suggestions and complaints entered on all computers with the `GRIPE` verb (see § 11.1) are sent immediately by e-mail to `daip` and thereby to all members of the group. All traffic via daip from 2000 to the present is archived at `https://listmgr.nrao.edu/pipermail/daip` and is well-known to Google. You might try Googling your AIPS error message to see if you get something useful. We stand willing, and are now able, to respond to user problems and requests on a timely basis.

The Gripes database described in AIPS Memo No. 88 used to be maintained, but appears to have disappeared.

Z.1.4 Solving problems at the NRAO

Below are details specific to NRAO systems for handling some of the problems which may arise in AIPS.

Z.1.4.1 Booting the workstations

Modern workstations, especially the powerful PCs and Macs, are complex Unix systems which may have remote users within the NRAO and guests from elsewhere on the Internet. Users should *never* attempt to boot the system on their own. If the machine appears to be dead, find or call one of the people listed on the bulletin boards in the AIPS Caige for this purpose.

Z.1.4.2 Printout fails to appear

Check the AIPS output messages that appeared shortly after you submitted your print job, whether it be from `PRTMSG` or `LWPLA`, or some other task. You should see the output of the Unix command to show the printer queue status. If anything went wrong with the print submission, an error message should be obvious. If not, check the output of the `lpq` command, see what print queue was involved, and check it again from the Unix command level (not from inside `AIPS`).

`AIPS` will delete spooled files about 5 minutes after they are submitted. If the print queue is stalled (due, say, to a jammed printer) or backed up with a lot of jobs, it is possible that the file was deleted before it was gobbled up by the print spooler. This time delay has been made a locally-controlled parameter, so it is possible to set it to values higher than 5 minutes.

Finally, check to see if the printout was (a) diverted to the "big" printer (`psnet` in room 213 at the AOC or `ps3dup` in the Charlottesville library) because it was too long for the smaller printers, (b) you forgot which printer you had selected on `aips` startup, or, at the AOC, (c) someone has taken the output and filed it in the "today" file bin (at the AOC this is on the left side of the post directly behind the `psnet` printer).

Z.1.4.3 Stopping excess printout

To find out what jobs are in the spooling queue for the relevant printer, type, at the monitor level:

$ lpq C_R	to list default print queue
$ lpstat C_R	to list default print queue under Solaris

or to display a specific queue

$ lpq -P*ppp* C_R	to show printer *ppp*

where *ppp might* be `psnet` at the AOC or `ps3dup` in Charlottesville. If the file is still in the queue as job number *nn*, you can type simply

$ lprm -P*ppp nn* C_R	to remove the job

`lprm` and `cancel` will announce the names of any files that they remove and are silent if there are no jobs in the queue which match the request.

Unfortunately, it is now very difficult to stop long print jobs. The large memories of modern printers mean that more than one print job can already be resident in the printer while your long unwanted job is being printed. Therefore, turning off the printer is not an option. Try to be more careful and not generate excess printout in the first place (save a tree). *AIPS* tasks now check the size of print jobs that will go directly to a printer and ask if you really mean to print them.

A nice option available for most *AIPS* print tasks or verbs is adverb `OUTPRINT` which allows you to divert the output to a text file. Then you can use an editor like `emacs` to examine the file in detail before printing. The Unix command `wc -l file` will count the number of lines in a text file called `file` for you; note that `-l` is the letter ell, not the number one. *AIPS* provides a "filter" program to convert plain (or Fortran) text files to PostScript for printing on PostScript printers. The command

$ F2PS -*nn* < *file* | lpr -P*ppp*

will print text file *file* on PostScript printer *ppp*. The parameter *nn* is the number of lines per page used inside *AIPS*; it is likely to be 97 if direct printing comes out in "portrait" form or 61 if the direct print outs come out in "landscape" form.

Z.1.4.4 `CTRL Z` problems

The last process placed in the background via `CTRL Z` can be brought back to the foreground by typing fg C_R in response to the monitor level `%` or `$` (or whatever) prompt Alternatively, the user can type jobs C_R, which displays all background processes associated with the current login and can bring a specific process to the foreground by typing fg *% m* C_R, where *m* is the job number as displayed by the `jobs` command as `[`*m*`]`. For example, if a user initiated his `AIPS`*n* by typing aips new pr=4 C_R and:

`^Z`	`CTRL Z` typed by accident (or intentionally).
`Stopped`	`aips new` is put in the background as "stopped" and user is returned to the Unix level.
$ jobs C_R	to display status of background jobs.
`[1] + Stopped     aips new`	info from Unix, where `[1]` means job 1, "Stopped" is job 1's state and "aips new" is the command used to start up job 1.
$ fg *m* C_R	to return job *m* to the foreground.
`aips new`	appears on the screen just to tell the user to which job he is talking (*i.e.*, it does *not* re-execute `aips new`). You should now be talking to your `AIPS`*n* again.
C_R	to get `AIPS`*n* > prompt.

Z.1.4.5 "File system is full" message

The message `write failed, file system is full` will appear when the search for scratch space encounters a disk or disks without enough space. This is only a problem when none of the disks available for scratch files has enough space, at which point the task will shut down. Use the `BADDISK` adverb to avoid disks with little available space.

Z.1.4.6 I can't use my data disk!

If at some point during your work you find you are prevented from reading or writing files on a data disk, it could be that your *AIPS* number does not have access to that area. If you encounter the message:

```
AIPS 2:  CATOPN: ACCESS DENIED TO DISK 8 FOR USER 1783
```

it means that user 1783 has not been given access to write (or read) on disk 8. This can be seen, in the `AIPS` session, by typing `FREESPAC` to list the mounted disks. If you see a data disk listed with an access of `Not you`, it means your *AIPS* number has not been enabled for that disk. If you feel that you should have access to that particular disk, see the data analysts (at the AOC) or an *AIPS* Manager about enabling your user number.

Z.2 *AIPS* at the NRAO AOC in Socorro

A small visitor facility for *AIPS* users is available in both Charlottesville and Green Bank. However, most non-NRAO people wishing to reduce data at an NRAO facility with *AIPS* should consider coming to Socorro. Not only is the green chili good, but the user facilities are quite substantial.

Public workstations at the AOC are Linux computers, many being two processor, 8 core machines with 24 Gbyte of RAM and a lot (4 Terabytes) of disk. A complete list of the public-use workstations can be found on the web at `https://www.aoc.nrao.edu/computing/workstations.shtml`.

Of the several printers available at the AOC, most *AIPS* users will want to use the high-volume PostScript printer `aoc213` and the Tektronix color printer `aoc213c`, both of which are located in Room 213.

You may also use the cluster computers and Lustre disk farm at the AOC remotely. Information about reserving such usage may be found at `httpss://info.nrao.edu/computing/guide/cluster-processing`. You may need to use your `my.nrao` login to submit a helpdesk ticket requesting this usage.

Z.2.1 Reserving public-use workstations at the AOC

If you are visiting the AOC for observing or to reduce data then you should fill out a visitor reservation form at least two weeks before you expect to arrive. These forms can be found on the web at `https://www.aoc.nrao.edu/`, select "Official Visitors", then "regular reservation form", log in with your `my.nrao` account, and follow instructions from there. If you check "OBSERVING AND/OR DATA REDUCTION" as your purpose of visit at the end of Section A of the reservation form, then you will automatically be assigned an observer login account and a workstation. If you have any special data reduction needs, you should make a note of them in the comments section of the form.

If you are unable to fill out this form using the web or if you have any questions about reservations, you should contact AOC reservations at 575–835–7357 or `nmreserv nrao.edu`. Note that reservations for VLBA projects will not be accepted unless the observer has been notified that correlation is complete and that the data have been scrutinized. If you have any special data reduction needs then you should make a note of them in the Section C of the form.

If you are an AOC staff member and wish to sign up for a public-use workstation then you should contact `helpdesk@nrao.edu` or visit real people in Room 262. You are expected to use your own login account on the public workstations. In general, visitor's reservations take priority over reservations for AOC staff.

Z.2.2 Using Linux workstations at the AOC — introduction

In order to start *AIPS* you need to log in to your assigned workstation and open a terminal window. At the AOC, we generally use the windowing environments supplied by the operating system vendors (RedHat Linux) rather than imposing a lowest-common-denominator "standard" environment. This means that the procedures for logging on and manipulating windows depend on the current version of Linux, which will progress with time.

On sitting down at a workstation you will be presented with a log-in window that has a space for you to type your user name. Enter your assigned username and press return and then, when prompted, enter your password and press return again.

You will be presented with a rather vanilla X-Windows screen. Figure out how to start a terminal window of some sort, `xterms` are preferred.

Z.2.3 Starting *AIPS*

Once you have logged in to your workstation and have a terminal emulator window open, you may start *AIPS*İf you wish to run *AIPS* on the machine at which you are sitting we recommend that you start *AIPS* with the following command.

```
aips pr=3
```

This will bypass the printer menu and select the high-volume PostScript printer `aoc213/dup` in Room 213 as the default *AIPS* printer.

Note that *AIPS* is configured to start a separate message window at the AOC. If you do not want the separate message window to appear, issue one of the following commands before starting *AIPS*.

```
export AIPS_MSG_EMULATOR=none
```

If you are using the KornShell or bash or.

```
setenv AIPS_MSG_EMULATOR none
```

if you are using csh or tcsh. You can move the cursor into the message window and hit `CTRL-Z` to cause it to disappear instead.

You may replace `xterm` with the name of another terminal emulator (e.g. `dtterm`) if you wish and you can also turn off the Tektronix emulator using one of the following commands.

```
export AIPS_TEK_EMULATOR=none
```

If you are using the KornShell or bash,

```
setenv AIPS_TEK_EMULATOR none
```

if you are using csh or tcsh. This emulator is easily ignored.

If the *AIPS* TV is already running, you may use the following to avoid the messages that are produced as *AIPS* figures out whether the TV is already running.

```
aips tst pr=4 tvok
```

Z.2.3.1 Starting AIPS on another machine

If you are going to run AIPS on a remote machine and use your local workstation as a display, we recommend that you start AIPS on your local workstation first and allow it to start the TV. You can then iconize the terminal that you are using to run AIPS and open a new terminal window. You should then use the `slogin` command to log in to the remote machine. You should then start AIPS using the following command.

```
aips tst pr=4 tv=mydisplay tvok
```

You should replace `mydisplay` with the name of the workstation at which you are sitting.

Z.2.3.2 On-line FILLM

On-line `FILLM` applied to the old VLA and does not apply now.

Z.3 AIPS at the NRAO in Charlottesville and Green Bank

AIPS is installed in Charlottesville based on the Linux computer named `valen`. Similarly, it is installed in Green Bank on a computer named `bratac`. The installations are current, with Midnight Jobs updating the development version each night. However, there are no current members of the AIPS group at either site, so the actual state of AIPS usage, particularly for visitors, is hard to determine from Socorro. Both sites have visitor procedures and welcome outside visitors. However, Charlottesville is concerned with ALMA users wishing to use `CASA` and Green Bank is concerned with GBT users needing to use `GBT-IDL`. Visitor information for both sites can be found from the main NRAO web site, including forms to register a visit and much information. Visitors to Charlottesville and Green Bank should inquire locally for information concerning public workstations supporting AIPS.

Z.4 Additional recipes

Z.4.1 Going bananas with bananas

1. Garnish a baked ham or ham steak with bananas.
2. Make a quick, rich desert with bananas and cream.
3. Bananas are perfect for lunch boxes. They come in their own wrapper, are easy to eat and mess-less.
4. Slice a banana in half lengthwise, brush with melted butter and bake it until tender; serve it as a “vegetable” with roasted meats or fish. Very Caribbean.
5. Don’t forget old favorites like bananas sliced over cereal, diced in pancake batter, or buried midst the ice cream in a banana split.
6. Slice and stir-fry bananas with carrots, tomatoes and ground beef for a super-quick main dish.

Z.4.2 Banana-chocolate tea bread

1. Cream 1/2 cup softened **butter**, gradually add 1 cup **sugar**, beating until light and fluffy. Add 2 **eggs**, one at a time, beating well after each addition.
2. Combine 1 1/2 cups all-purpose **flour**, 2 tablespoons **cocoa**, 1 teaspoon **baking soda**, 1 teaspoon **salt**, and 1/2 teaspoon `cinnamon`; sift together.
3. Stir flour mixture into egg mixture, blending well.
4. Add 1 teaspoon **vanilla extract**; stir in 1 cup mashed **banana**, 1/2 cup **sour cream**, 1/2 cup chopped **walnuts**, and 1/3 cup miniature **semi-sweet chocolate chips**.
5. Spoon batter into two greased and floured 7-1/2 x 3 x 2-inch loaf pans. Bake at 350° F for 55 minutes or until a wooden pick inserted in center comes out clean. Cool in pans 10 minutes, remove from pans and cool completely on a wire rack.

Thanks to Tim D. Culey, Baton Rouge, La. (`tsculey@bigfoot.com`).

Z.4.3 Banana caramel pie

1. Mix 1 cup **dark brown sugar**, 1/4 cup **all-purpose flour**, 1/4 teaspoon **salt** in a saucepan. Stir in 1/4 cup **cold water** and 2 **egg yolks**. Beat until smooth.
2. Gradually stir in 1 cup **boiling water**. Then cook, stirring constantly, about 3 minutes until smoothly thickened.
3. Stir in 1 tablespoon **butter**, 1/2 teaspoon **vanilla**, and 1/4 cup **evaporated milk**. Cool slightly.
4. Pour into pre-baked, cooled 8 or 9 inch **pastry pie shell**.
5. Slightly before serving, slice 4 ripe **bananas** and arrange over filling. Top with whipped cream or with a meringue made out of the 2 left-over egg whites.

Z.4.4 Curried shrimp

1. Cook 2 1/2 pounds **shrimp** for 3 minutes. Peel and devein.
2. Heat 1/3 pound **butter** or margarine in large saucepan. Saute 4 chopped **scallions** and 2 cups chopped, peeled **apples** until tender. Stir in 2 tablespoons **curry powder**, 1 tablespoon **ground ginger**, and 1/3 cup **flour**. Stir for 2 minutes. Remove from heat and blend in 3 cups **chicken broth**. Return to heat, cook stirring until mixture boils and thickens.
3. Add 1 pound roasted **cashews**, 1 pound **Turkish apricots**, and, if desired, 2 ounces diced **crystallized ginger** and **raisins**. Cook over low heat for 15 minutes.
4. Add shrimp and mix in.
5. Cut 3 **bananas** into thick slices and add to mixture. Serve over cooked white or curried rice.

Thanks to Chiquita Bananas.