// A I P S L E T T E R

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A newsletter for users of the NRAO
Astronomical Image Processing System

Written by a cast of *AIPS*

Edited by
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General developments in *AIPS*

Current and future releases

We do not expect to have any further formal releases of *AIPS*. Instead, *AIPS* has been available as the 31DEC99 version since October 1999. This version remains under development by the (reduced) *AIPS* Group to correct and improve this "*AIPS* for the Ages" indefinitely. You may fetch and install a complete copy of this version at any time. Having done so, you may update your installation whenever you want either as a whole or by running the so-called "midnight job" which uses transaction files to copy and compile the code selectively based on the code changes and compilations we have done. We expect that most users will take the source-only version of *AIPS* over the Internet (via *anonymous* ftp), but we can ship it on more traditional media if requested (contact Ernie Allen at the address given in the masthead). *AIPS* is now copyright © 1995 through 2000 by Associated Universities, Inc., NRAO's parent corporation, but may be made freely available under the terms of the Free Software Foundation's General Public License (GPL). This means that User Agreements are no longer required, that *AIPS* may be obtained via anonymous ftp without contacting NRAO, and that the software may be redistributed (and/or modified), under certain conditions. The full text of the GPL can be found in the 15JUL95 *AIPSLetter*.

Personnel

The *AIPS* Group, none of whom work full time on *AIPS*, has consisted of Chris Flatters, Ketan Desai, and Leonia Kogan doing programming and user support at the AOC in Socorro and Eric Greisen and Pat Murphy performing similar roles in Charlottesville. Ernie Allen handles data base and shipping chores for the Group. This is a pretty minimal group to support such a large and widespread software package. Unfortunately, this group has been eroding. Pat is also the Computer Division Head for Charlottesville, a nearly full-time job. Ketan has now left the group to find greener pastures working in the New York City area. We wish him well in his new endeavors, but his departure has left us below minimum strength.

Two actions are being taken to address this. First, Eric is moving to Socorro for the period from April to the middle of October. Second, despite NRAO's current financial problems, a position to replace Ketan has been announced. The full text of this announcement appears in the following pages. All things being equal, a VLBI-knowledgeable radio astronomer with *AIPS* and software support experience would be our ideal candidate.

AIPS position available

Assistant Scientist - AIPS Project
NATIONAL RADIO ASTRONOMY OBSERVATORY
Personnel Office
P.O. Box 0
Socorro, NM 87801
Email Submission: `alewis@nrao.edu`
Attention: A. Lewis

The Astronomical Image Processing System (AIPS) is a software package for reducing data from single-dish and array radio telescopes in the US and throughout the world. More information on AIPS is available from the AIPS home page at `http://www.cv.nrao.edu/aips/`.

The AIPS software group has a job vacancy at the National Radio Astronomy Observatory Array Operations Center in Socorro, New Mexico. The duties will be to provide AIPS programming support for local and visiting astronomers, participate in software development in support of NRAO instruments and programs, and to coordinate with the scientific staff on data-reduction software issues. We anticipate that up to 20 hours a week of the applicant's time will be required to perform these duties; the remainder will be available for independent research. We are particularly interested in applicants with VLBI experience.

Substantial experience using and programming in AIPS is expected. Experience with Unix system administration and/or scientific user support is desirable. A strong background in radio astronomy is required. This position has an initial term of three years; further extension may be possible.

Socorro is a small historic town (pop. 9000) in the mid Rio Grande valley of New Mexico. More information can be obtained from the Socorro Home Page at `http://www.socorro.com`

Further information on NRAO is available from the NRAO Home Page `http://www.nrao.edu`. Please contact Tony Beasley (`tbeasley@nrao.edu`) for more information on this position.

Applications should be addressed to A. Lewis at the above address. First consideration of applications will occur May 01 2000. AAE/EOE.

Simulating *uv* data for an array design

The recently written task `UVCON` generates a *uv* database for an interferometric array whose configuration is specified by the user. Visibilities corresponding to a specified model with Gaussian noise appropriate for the specified antenna characteristics are calculated. The output is a standard AIPS *uv* data file. This task replaces the old simulating procedure which required use of the AIPS tasks `UVSIM`, `UVSUB`, and `UVMOD` and verb `PUTHEAD`. The array geometry can be specified in four different coordinate systems: earth-centered equatorial, local tangent plane, geodetic, and array-centered equatorial. The antenna diameters, efficiency, noise temperature, and number of levels in the digitizer are used to calculate the noise level for the given visibility. An atmospheric contribution to the noise level is now available.

Having simulated the *uv* data, the whole power of AIPS can be used for imaging, plotting, printing, and editing. In particular, the standard AIPS tasks `UVPLT`, `IMAGR`, `KNTR`, and `LWPLA` can be used for creating the *uv* coverage, beam pattern, and simulated image files in PostScript format.

The task has successfully used for the array configuration design of the VLA expansion project by R. Perley and ALMA project by Kogan, L., ALMA Memo #247, 1999, ALMA Memo #296, 2000; by Conway, J., ALMA Memo #291, 2000; and by Heddle, S., and Webster, A., ALMA Memo #290, 2000. The last memo "describes some progress that has been made towards automation of simulations using straightforward shell scripts applied while running Linux, with Classic AIPS as the core simulation tool." All Memos may be obtained on the WWW at `http://www.alma.nrao.edu/memos/index.html`.

Improvements of interest to users in 31DEC99

Although we do not intend to have any more formal, frozen releases, we expect to continue publishing the *AIPSLetter* approximately every six months so long as there are things to report and an audience to care. Among the new thing in 31DEC99 over the past six months are two tasks: SCIMG, a multi-field iterative imaging and self-calibration program and FGPLT, a program to illustrate when data are flagged. There are major new options in the main imaging task IMAGR, significant enhancements to interactive editing tasks, and new verbs to help manage slices. Several significant bugs were corrected as well.

31DEC99 is compatible in all major ways with the other 1999 and 15OCT98 releases. There are significant incompatibilities with older versions of *AIPS*.

Imaging

IMAGR

A multi-resolution variant of the Clean algorithm has been added to IMAGR. It takes advantage of the multiple field capabilities to model the source simultaneously as a collection of Gaussian objects of user-specified widths. The same part of the sky is imaged at several different resolutions corresponding to these widths. Clean then selects the strongest field and removes some number of components from it. The only differences from normal Clean are in the tapers applied to the image and the subtraction of a circular Gaussian rather than a point from the *uv* data. The present algorithm is based on a description of a "multi-scale" Clean given by Mark Holdaway and Tim Cornwell at an imaging meeting in Socorro in 1999, but it is likely to differ from their algorithm in significant details. The IMAGR version offers two simple adverbs, NGAUSS and WGAUSS, to specify the use of this new technique and offers numerous "knobs" in some of the IMAGRPRM adverb to adjust its behavior. Users should try this new technique with caution — use DOTV true; please report your experiences to egreisen@nrao.edu.

The output class names from all imaging tasks were changed; the previous usage of 0-relative, extended hexadecimal was confusing to users. The new names are *x*IM*nnn*, *x*CL*nnn*, and *x*BM*nnn*, where *x* is the Stokes code and *nnn* is the field number from 001 to 512. All calibration tasks can recognize either old- or new-style names for modeling, but earlier versions of *AIPS* will not recognize the new names. Writers of procedures should remember that *AIPS* file naming adverbs support a variety of powerful wild-card conventions.

Another new option is encoded in the new ALLOKAY adverb. This allows the user to reassure IMAGR that the pre-existing beam images and even the pre-existing IMAGR work file do not need to be recomputed. For restarts with multiple beam images and with large numbers of components, this can be a considerable savings in time. The previous version of IMAGR limited a user to 256 Clean boxes per field no matter how many fields were in use. This has been changed to allow up to 2048 boxes per field up to 64 fields. If there are more fields, then the maximum in any field is (131072 / NFIELD). When imaging more than one field, a field status line will appear above the menu on the TV display.

A number of subtle bugs — with unsubtle consequences — were corrected. A compiler peculiarity in round off affected only Linux systems (see programmer section) and caused the uniform weighting to fail on rare occasions. If the first field was small enough to be gridded in core, the creation of scratch files for later, larger fields was compromised. The routine that decided how big to make the gridding and gridded subtraction scratch files did not use the same formulation as the routines that use the files. In some cases, this could result in a failure due to a too-small scratch file. The Clean component filtering routine had an error causing it to over-write memory near but not in the designated array. This too could appear as a data- and architecture-dependent failure.

Other imaging changes

SCIMG is a new task to image and self-calibrate a *uv*-dataset iteratively. It allows large numbers of fields and most of the multi-field options of IMAGR, but does not include (as yet) the experimental variations on Clean found there. SCMAP is single-field version, retained for simplicity.

MAPPR is a new standard procedure which provides a simplified access to IMAGR. It is for a single field image on pre-calibrated data without the experimental options.

CMETHOD adverb allows the user to have the task select DFT or gridded subtraction depending on which is faster. This option was added to FRING and KRING. It was found that the formulas used were no longer appropriate to modern workstations. Much worse was the fact that in almost all calibration-like tasks, the grid size was not set when the decision was made. This was a serious bias in favor of gridded subtraction. We made timing measurements, changed the formula, and saw to it that all parameters are known before the decision is made.

SETFC did not use the correct coordinates for multi-source files and did not handle "negative" right ascensions and even negative declinations correctly. The task was changed to use, for the center fly's eye, a grid of field centers in a -SIN projection like geometry. The attempt to be linear in RA and declination did not work near the poles.

Interferometric data editing

EDITR, EDITA, et al.

The object-based EDIT class in *AIPS* was changed to allow for very rapid editing of multiple-IF, multiple-polarization data. This edit class is found directly in the tasks EDITR, EDITA, and SNEDT and is available as a menu option in the self-calibration and imaging tasks SCIMG and SCMAP. The biggest change was to allow, under control of the CROWDED adverb, the simultaneous display of both polarizations and/or all IFs in the data. The tasks begin with a "crowded" display, but the user may select interactively whatever combination of single or multiple IFs and polarizations are desired for the current display and editing. A new menu option, NEXT CORRELATOR, was added to assist in this selection. The crowded display posed significant complications in determining what data sample is being selected by the TV cursor. In some cases, multiple samples are plotted on the same TV pixel and, in these cases, all samples on that pixel are selected when the pixel is selected. Getting all samples deleted, including the affects of the ALL-IF, ALL-POL, and antenna selection flags, posed several interesting challenges.

Tasks EDITA, EDITR, and SNEDT had adverbs REASON and ANTUSE added to allow the user to select the initial "reason" string and initially displayed antennas. Both of these may then be changed interactively. The ability to specify amplitude displays from 0 to maximum rather than minimum to maximum was added. If these tasks start with EXPERT true, certain display limits and flag settings are now different than in the menu-driven mode. The computation of differences between the data and a running mean of the data was postponed until just before it is needed for display. This avoids potentially long waits for these data which may never be displayed with the current settings.

SPFLG

SPFLG was substantially revised so that the horizontal axis contains all selected spectral channels for all selected IFs. This avoids have to display one IF after another while editing. It is tedious enough to have to loop over polarization and baseline without this extra loop and modern TV displays are usually wide enough to encompass the longer rows. The task is aware of which IF and channel are being selected and does appropriate displays and deletions depending on the setting of the ALL-IF flag. The SWITCH ALL-BL FLAG option from current vs all baselines to a 4-position switch with all baselines to each 1 of the antennas included as choices.

During this upgrade, a number of error in SPFLG (and TVFLG) were uncovered. An error in the declaration of the FC table common and I/O buffer caused the flag listing to be peculiar and caused Linux systems at least to die on UNFLAG operations. An error recording the current Stokes caused later REDO flag operations to behave incorrectly. TVFLG now requires the user to type an IF or channel number only if there are more than two of them.

VLBI and interferometric data handling

Phase re-referencing

The subroutine used by `CALIB`, `CLCAL`, `FRING`, and `KRING` (at least) to bring the `SN` tables to a common phase reference was rewritten. `CALREF` changes the reference antenna for a single IF, polarization, and subarray. It interpolates between or extrapolates from tabulated values of the phase, delay, and rate corrections for the old reference antenna relative to the new one that have been extracted from the table and smoothed using boxcar functions in time. It uses the smoothed rate corrections to provide time derivatives for the phase and delay corrections during interpolation/extrapolation. `CALREF` now reports an error if the old and new reference antennae cannot be related to one another; it no longer fails if there is only one solution linking the two. Delays are now interpolated using the rate as the first derivative of delay with respect to time. The correct interpolation tables are now used if the smoothing times are small and smoothing times now conform to the header comments. It no longer applies a spurious delay correction, it avoids overflows in computing `ATAN2` properly and excess arguments (including a large work array) have been removed.

Both `FRING` and `KRING` had errors which caused them to fail to change the reference antenna for the second polarization. The calling tasks now allocate needed memory dynamically to handle the table being modified. They issue warnings but continue when `CALREF` finds no connection between the old and new reference antennae. This is often triggered by the use of different reference antennae in different subarrays.

FILLM and DOCALIB = 2

`FILLM` has offered the option to set the weights using the antenna temperatures recorded with the data. This option was deprecated since the absolute calibration of the system temperatures is unreliable for the frequency and date of observation. Ketan Desai found that the "nominal sensitivity" is recorded with the data. This is the system level information used to scale the visibilities approximately to deciJanskys prior to calibration. If one uses these sensitivities also to set the weights, and then applies the flux calibration to the those weights, the resulting weights should represent $1/\sigma^2$ which is desired in averaging and imaging. At present, the user has to instruct `FILLM` to use this option with the third bit in `CPARM(2)`, *i.e.*, set `CPARM(2) = 8 +` other options. All calibration tasks were changed to have `DOCALIB = 2` mean to apply the calibration to the visibilities and the weights, while `DOCALIB = 1` calibrates only the visibilities in *all* tasks. Previously, some VLBI-oriented tasks applied weight calibration, `SPLIT` and `SPLAT` offered the choice, and the rest never calibrated the weights.

DBCON

`DBCON` has the thankless task of trying to combine two datasets that may actually be rather different. One thing it can do is combine data sets with different numbers of polarizations. A patch was issued correcting errors in handling that case. Position shifting is done with the best estimate of the frequency of each channel; obsolete information about options to avoid this was removed. Previously, `DBCON` retained the two sets of frequency identifier numbers unchanged and only issued a mild warning if this seemed likely to be wrong. Now, it renumbers the `FQ` values for the second data set to match (or add to) the first data set.

Other *uv*-data changes

UVCOP failed to subtract the 5-day offset correctly when making a single subarray dataset from a multiple subarray one. It produced times a bit greater than -5 days. It also was able to get the wrong subarray due to an inadequate round up.

UVFIX corrected phases using the first channel as the reference channel rather than the correct channel. The computation of projected baselines was changed to the aberrated source direction which seems to improve some astrometric results. (Unexplained variations in the "plate solutions" with epoch for VLA images still remain.)

UJOIN was changed to put the IF selection in the copied tables. The flagging of data under the DOWEIGHT was corrected and the meaning of DOWEIGHT was changed. Additional explanatory messages and frequency checks were added and the help file was made clearer.

CALIB and BPASS were changed to check for inconsistencies in the user parameters and to refuse to proceed when in doubt as to the intentions.

TI2HA was changed to correct times for subarray number (under user control) and to use the output name adverbs.

UVMTH was changed to handle compressed data, to use whatever dynamic memory is needed, and to handle the two data sets independently. It and DIFUV were made more immune to differences between the two input data sets.

TBIN had trouble with flagged rows in the table when reading the tables some columns at a time. In that mode it must, and now does, flag the row only when writing the last columns.

Data display

FGPLT

FGPLT is a new task to display the times when *uv*-data samples are flagged. The vertical axis is correlator from the selected portion of the data set. Horizontal lines are drawn to illustrate the times at which each correlator is flagged in the FG table. Since the VLBA Correlator now generates the initial FG table for its output, this task was conceived as a means to evaluate the observing and correlation success of a data set. General users should find it interesting when evaluating the consequences of the various non-interactive editing tasks in *AIPS*. Tasks like CLIPM and UVLMN, in particular, write FG tables which could be explored with FGPLT.

Other data display changes

VPLOT was changed to allow the plotting of more data points, to allow flagging all channels based on the data of one spectral channel, and to plot a wider choice of parameters with time averaging.

adverbs for numerous tasks were changed. The adverb NCOUNT had migrated to so many functions that users were tripping over themselves. New adverbs BPRINT, EPRINT, NPRINT, and NPLOTS were created and put in place of the overworked adverbs.

general The tick mark algorithm was given a little more work to insure that at least two labeled tick marks appear even in small plots.

Clean box display and setting had several minor bugs corrected. The most mysterious caused boxes outside the display area to move during the FILEBOX operation.

POSSM had two errors corrected which were due to using the wrong version of the data header. One caused frequencies in plots 2 – NPLOTS on each page to be wrong; the first plot was correct.

Analysis and documentation

Slices

AIPS has been using an `xterm` or similar XWindows terminal emulation program to emulate the old Tektronix display device. While this works very well for display, it appears to be unreliable on all systems for cursor reading. It works just enough to be interesting and then returns incorrect values for the cursor position. The most significant use of the TK cursor reading was in setting the inputs for fitting Gaussians to slices. To get around the TK unreliability, we have written a parallel set of TV verbs for all the TK slice operations. These are `TVSLICE`, `TVASLICE`, `TVMODEL`, `TVAMODEL`, `TVRESID`, `TVARESID`, `TVGUESS`, and `TVAGUESS` for plotting slices, models, residuals, and guesses and `TVSET` and `TV1SET` for setting the guess parameters.

In testing the new verbs, the display of fit values and uncertainties by `SLFIT` was improved. The internal and "scientific" units are both displayed and labeled. Note that the units of the adverbs to `SLFIT` remain the "scientific" (actually plot) units, namely those displayed on the `TKSLICE` or `TVSLICE` plot, *e.g.*, mJy and asec.

Other analysis changes

CONFI is being used to study array configurations for ALMA and other telescopes. New configuration optimization and constraint options were added in support of this. It was revised to handle the new ALMA site topography file that has both better resolution and a much larger coverage. Control over which antennas are to be held fixed was generalized.

UVHOL was revised to allow removal of samples at both ends of each holography scan.

JMFIT was corrected to report the offset term in the correct units; it was correctly computed. The default handling of `GMAX` was corrected to match the help file and `IMFIT`.

IRING used an incorrect convention for position angle. It has been corrected to measure East from North even in rotated images.

BSMOD was changed to generate single-dish, beam-switched continuum datasets without requiring an input dataset..

BSCLN is a new task to Clean beam-switched continuum images. The one-dimension task `BSTST` also has new Clean options. The Cleaning is described in ADASS talks at
`ftp://ftp.cv.nrao.edu/egreisen/SWpaper.ps.gz` and
`ftp://ftp.cv.nrao.edu/egreisen/SWposter.my.ps.gz`.

Documentation

Unfortunately, the files used by `ABOUT` require manual intervention to update. We remember to do this on occasion and have done so at least once for `31DEC99` already. There are enough changes to software since the last major revision of the *CookBook* that we also have revised virtually all chapters to the `31DEC99` version. They are available from the WWW Table of Contents at `http://www.cv.nrao.edu/aips/cook.html` which also has summaries of the changes made on a chapter-by-chapter basis. The main reasons for changes included `VPUT`, `VGET`, `FITAB`, `TAPES`, `DEFAULT`, numerous new options in `EDITR` and `IMAGR`, `PRINTER`, new adverb and class names, `CLIPM`, `UVMLN`, and TV connectivity and start-up changes.

Going AIPS has not been revised since 1990. But it is still surprisingly useful. It has been made available on a chapter-by-chapter basis from the WWW Table of Contents at
`http://www.cv.nrao.edu/aips/goaips.html`.
We are toying with the idea of upgrading some of the material.

We have run out of pre-printed covers for the *CookBook* and for *Going AIPS* and do not plan to print more. PostScript and jpg versions of the covers are available from the *AIPS* WWW pages.

Programmer tidbits

Round off is handled differently by different compilers/architectures. In particular, the sequence `A = B * C` followed by `I = A + 0.5` gets a different result than `I = B * C + 0.5`. Therefore, when two computations are required to get the same result, *i.e.*, in computing offsets into an array, they must be expressed in the same fashion.

Linux compiler options were changed to test for unused and uninitialized variables. The egcs compiler is not fooled by a `DATA` statement into thinking that a variable is used.

Long long variables in C, such as those used for byte offsets into data files in those systems allowing files larger than 2 Gbyte, require a different format identifier (`%lld` rather than `%d`). This seems to work on all architectures but alphas where it will not be needed.

Y2K police have been busily reading all the precursor comments throughout the *AIPS* code. To forestall further complaints, we have changed the precursor comments a few places to match the already correct code. No actual problems have been found.

New AIPS Installation Wizard

In order to make the installation of the `31DEC99` version of *AIPS* easier, the whole installation process has been overhauled and re-thought. While the old `INSTEP1` procedure was a significant improvement over what came before, it is now eight years old and is difficult to maintain or improve incrementally. The new approach is inspired somewhat by the intermediate `update.pl` perl script that some of you have used to install `31DEC99`, and also by what one typically encounters with modern software installs. The `update.pl` script is limited in that it expects you to have an older version of *AIPS* already installed.

Based on the experience of `update.pl`, we decided to stick with perl as the language in which to write the new wizard. Given that perl is now ubiquitous, comes with Linux in most, if not all, distributions, and is otherwise freely available under the Artistic License, it is our hope that the requirement of having perl (version 5) should not cause undue hardship for our users. You may find copies of perl at `http://www.perl.org/`.

Some features of the new `install.pl` script include:

- Gathers all information before doing anything.
- Offers to retrieve and unpack the distribution if not already done.
- Does system "Search and Discovery" with significant improvements over previous installation codes.
- Allows you to save configuration and continue later.
- Permits "back", "next", and "quit" at each step.
- Does *not* use a GUI; uses short plain text menus instead.

The choice not to use a Graphical User Interface for this wizard was partly pragmatic and partly philosophical. Adding such a feature would have entailed much additional work, requiring resources (people, time) not currently available to the *AIPS* Group. Any added functionality would have been questionable at best given the cost in such resources.

At the time of writing, this wizard is still in preparation. We expect to have it available sometime in April 2000; please watch the *AIPS* home page at `http://www.cv.nrao.edu/aips/` for news on its testing and release.

Patch Distribution for 15OCT99

As before, important bug fixes and selected improvements in 15OCT99 can be downloaded via the Web at:

`http://www.cv.nrao.edu/aips/15OCT99/patches.html`

Alternatively one can use *anonymous* ftp on the NRAO cpu aips.nrao.edu. Documentation about patches to a release is placed in the anonymous-ftp area pub/aips/*release-name* and the code is placed in suitable subdirectories below this. Information on patches and how to fetch and apply them is also available through the World-Wide Web pages for *AIPS*. As bugs in 31DEC99 are found, they are simply corrected since 31DEC99 remains under development. Corrections and additions are made with a midnight job rather than with manual patches. Remember, no matter when you received your 15OCT99 "tape," *you must* fetch and install its patches if you require them. Also note that we do not expect to make any more patches to 15OCT99.

The 15OCT99 release had only a few important patches announced. These were:

1. DBCON fails combining data sets with different numbers of polarizations. 1999-11-23.
2. IMAGR fails when gridding large fields after gridding small fields. 1999-12-14
3. IMAGR fails when filtering Clean components for large fields. 2000-02-04

AIPS Distribution

By March 30, 2000, 76 sites have taken copies of 31DEC99 via ftp. A few of them have begun taking updates regularly via the "midnight job." We recommend this to all serious *AIPS* users.

A total of 301 copies of the 15OCT99 release were distributed to 276 non-NRAO sites. Of these, 145 were in source code form and 156 were distributed as binary executables. The figures on computers using *AIPS* are affected by the percentage of *AIPS* users that register with NRAO. Of 276 non-NRAO sites receiving 15OCT99 only 42 (15%!!) have registered. We remind serious *AIPS* users that registration is required in order to receive user support. The first table below shows the breakdown of how the copies of 15OCT99 were distributed and includes both source-code distributions and binary distributions. The second table below is based on the disappointing number of registered installations of 15OCT99. It lists total numbers of computers and indicates that the distribution over operating systems was heavily weighted toward Solaris with Linux as a distant second. However, when asked about "primary" architecture, 48% of our users answered Linux and 33% answered some flavor of Sun OS. This indicates how far Linux has penetrated as the system used on the more powerful computers used by astronomers today.

	ftp	CDrom	8mm	4mm	ZIP	Floppy
15OCT98	242	71	8	1	0	0
15APR99	290	69	0	2	0	0
15OCT99	227	72	0	2	0	0

OS	15OCT99 No.	15OCT99 %	15APR99 %	15OCT98 %	15APR98 %	15OCT97 %	15APR97 %	15OCT96 %
Solaris	84	56	53	61	66	50	66	46
PC Linux	43	29	27	27	19	23	16	19
HP-UX	10	7	2	5	2	3	6	4
SGI	9	6	13	1	3	1	1	5
SunOS 4	2	1	1	1	4	14	5	13
Alpha Linux	2	1	0	0				
Dec Alpha	1	1	4	3	7	9	6	10
IBM /AIX	0	0	0	2	1	0	0	4
Total	151							

Recent *AIPS* Memoranda

The following new memorandum is available from the *AIPS* home page.

103 Weighting data in AIPS
Ketan M. Desai
March 21, 2000
This memo describes the "correct" calculation of weights for VLA and VLBA data based primarily on phenomological considerations with a light sprinkling of theoretical grounding.