A I P S L E T T E R

Volume XXVII, Number 1: June 30, 2007

A newsletter for users of the NRAO
Astronomical Image Processing System

Written by a cast of *AIPS*

Edited by
Eric W. Greisen
National Radio Astronomy Observatory
P.O. Box O, Socorro, NM 87801–0387
505–835–7236; Fax 505–835–7027
daip@nrao.edu
http://www.aoc.nrao.edu/aips

General developments in *AIPS*

FILLM

31DEC06 contains a revision of FILLM which is essential to support the new data form to be produced by the VLA beginning in July 2007. VLA users will have to upgrade their copy of *AIPS* to 31DEC07 or 31DEC06 by that time. See below for more information about FILLM, including important patches to the 31DEC06 version of FILLM. Changes which are not in the 31DEC06 version may also be important to current observers.

Current and future releases

We have formal *AIPS* releases on an annual basis. While all architectures can do a full installation from the source files, Linux, Solaris, and MacIntosh OS/X (PPC and Intel) systems may install binary versions of recent releases. The next release is called 31DEC07 and remains under active development. You may fetch and install a copy of this version at any time using *anonymous* ftp for source-only copies and rsync for binary copies. This *AIPSLetter* is intended to advise you of improvements to date in this new release. Having fetched 31DEC07, you may update your installation whenever you want by running the so-called "Midnight Job" (MNJ) which uses cvs and transaction files to copy and compile the code selectively based on the code changes and compilations we have done. The MNJ will also update sites that have done a binary installation using cvs and rsync. There is a guide to the install script and an *AIPS* Manager FAQ page on the *AIPS* web site.

The MNJ serves up *AIPS* incrementally using the Unix tool cvs running with anonymous ftp. The binary MNJ also uses the tool rsync as does the binary installation. Linux sites will almost certainly have cvs installed; other sites may have installed it along with other GNU tools. Secondary MNJs will still be possible using ssh or rcp or NFS as with previous releases. We have found that cvs works very well, although it has one quirk. If a site modifies a file locally, but in an *AIPS*-standard directory, cvs will detect the modification and attempt to reconcile the local version with the NRAO-supplied version. This usually produces a file that will not compile or run as intended.

NRAO is 50 years old

The NRAO is celebrating is 50th year of existence. All sites, including the high site in Chile, were connected by television conferencing for brief remarks and a ceremonial cutting of cakes at each site. A symposium was held June 17–21 in Charlottesville, Virginia to celebrate the event entitled *Frontiers of Astrophysics: A Celebration of NRAO's 50th Anniversary: Astrophysics Across the Electromagnetic Spectrum*. To obtain more information, see `http://www.nrao.edu/50/`. It is hoped that the PowerPoint talks will appear on the web and that the whole symposium, which was said to be very good, will appear in a book.

Among the many letters received by the NRAO congratulating us on this anniversary was one which we thought would be of interest to *AIPS* users. It reads:

"Fifty years is a long time for the Italian radio astronomical community, which started 43 years ago with the completion of the Northern Cross in Bologna. It is probably fair to say that early interaction between Italians and US radio astronomers was at most sporadic at that time, with very little collaboration.

The construction of the VLA changed all this, and from the 1970s on, contacts have been intense. A whole generation of Italian radio astronomers could make use of advanced instrumentation and became strong admirers of the "American way" of doing science. Curiously enough perhaps it was not the hardware the most influential of all but a seemingly minor software development, which became known in the whole world as AIPS. The possibility to bring the software back home and have it run on extremely powerful computers (VAX) really changed the way in which scientific research was done. NRAO has made this revolution possible.

In the early eighties one still had to go to the VLA site to do the reduction of your own data: down there it took no more than a few minutes to get 100 CLEAN components, and this breathtaking speed could only be reached with the super-modern VAXes at the site. Many Italian astronomers have beautiful memories of nights spent at the VLA site, working in the AIPS-cage (after having struggled to reserve time on the VAX — only the feeding of sharks must have been a more ferocious and bloody show) and consuming gallons of (according to Italian taste[1]) awful coffee.

The next 50 years of NRAO will no doubt be quite different in nature, with personal contacts reduced because of high-speed electronic connections. Anyway, the future of radio astronomy is bright, owing to intense international collaborations and the new generation radio telescopes. Obviously the role of NRAO in the planned new generation instruments will be fundamental. The international radio astronomical community can only rejoice."

Signed for The Director and the Staff of the Istituto di Radioastronomia INAF by Dr.ssa Luigina Feretti.

Improvements of interest in `31DEC07`

We expect to continue publishing the *AIPSLetter* approximately every six months along with the annual releases. There have been quite a few changes in `31DEC07` in the last six months. Many have been the usual bug fixes, but there have also been a number of new verbs, tasks, and procedures as well as significant improvements in existing tasks. New tasks include `OOSUB` to apply a model to visibility data with spectral-dependent corrections, `VLANT` to correct phases for corrections in the antenna locations at the VLA, `CUBIT` (written by Judith Irwin) to fit models to full spectral cubes, and `UVDI1` to subtract the average of one *uv* data set from another. New verbs include `VLA`, `EVLA`, `VLBA` and `HSA` which read an antenna table and place suitable antenna numbers on the *POPS* stack.

`31DEC04` through `31DEC07` use a new numbering scheme for magnetic tape logical unit numbers that is incompatible with previous versions. Thus all tape tasks and the server `TPMON` must be from one of these four releases. Other than this, `31DEC07` is compatible in all major ways with the with the `15OCT98` and later releases. There are significant incompatibilities with older versions.

[1]Editor's note: not just Italian. . .

UV data calibration and handling

It has come to our attention that users now trust *AIPS* altogether too much. These users have assumed that all *AIPS* tasks apply a flag table if it is present. But that is not the case. The simple rules are: if FLAGVER is not an adverb to a task, flag tables are not applied in that task. If DOCALIB is not an adverb to a task, then SN and CL tables are not applied in that task. If DOBAND is not an adverb to a task, then bandpass tables are not applied in that task. We have begun a review of all *uv*-data tasks to determine which tasks would benefit by having flagging and calibration options. A number of changes have been made to the calibration system to enable the changes to the old, non-calibration tasks. Note that the package of data reading-flagging-calibration routines have limitations, primarily to restrict the output data to one sub-array and one frequency ID. Thus the newly modified tasks, while acquiring new capabilities, may have some of their previous capabilities curtailed.

The most sweeping change to the calibration routines is to allow the data to be in sort orders other than 'T*' where possible. For non-time sorted data, flagging is limited to 6000 flags applying to the full data set. Time sorted data work when no more than 6000 flags apply to a single time. If the data are not in time order, then time-dependent calibrations, DOCAL true and DOBAND greater than 1, are not allowed. Time independent bandpasses and polarization calibration are allowed in all sort orders. The tasks that apply flagging with their own flag routines, UVCOP, AVSPC, CVEL and SDVEL, were also modified to work with greater restrictions on data that is not in time order. The labeling and selection of polarizations in the calibration package was generalized to allow linear polarization (with many limitations), to allow a few additional STOKES values, such as 'CROS' and 'RLLR', and to allow specification that the I Stokes value is to be "formal" I. This last means that Stokes I is flagged unless *both* RR and LL or XX and YY are present. The new STOKES values 'F' and 'FQU' request this. See the revised STOKES help file for details.

Tasks FUDGE, UVLSF and UVLSD have been rearranged to offer the full suite of calibration adverbs. FUDGE is a "paraform" task used as a model for the creation of many "simple" one-data-set-in, one-data-set-out tasks and provides a pattern for changing many of the older, non-calibration tasks into the more complete form. The other two tasks really do not need the calibration adverbs, but flagging, particularly on a channel-dependent basis, will improve their performance.

UVMTH

Recently it was discovered that the VLA had developed a "correlator bias." This appears as a baseline, spectral channel, polarization, and IF dependent offset in the visibilities. When imaged, an object appears at the phase reference position (that used during observing) which cannot be Cleaned like true sources. In the case of the VLA, it appears that this bias has been present from September 2006 until late in June 2007. It is known to affect spectral-line observations at 25-MHz bandwidth, producing an "object" of some 100's of micro-Jansky. It is believed not to affect continuum data at this bandwidth. We have been unable to determine whether spectral-line observations at narrower bandwidths are similarly affected. The effect is seen only when there are adequate integration time and bandwidth to reduce the noise below these levels and when there is no strong source at the field center masking the offending object. It is thought that the VLA bias is only mildly time dependent, allowing the bias to be measured over significant periods during an observing run and applied to other times during that run. Measurements on consecutive days did show significant changes in the bias. UVMTH is a newly-upgraded task that can help VLA observers deal with this problem. It may also be useful with GMRT data, for which there is also evidence of correlator bias.

UVMTH averages the visibilities in a *uv* data set on each baseline and correlator and adds them to, subtracts them from, multiplies them by, or divides them into the visibilities in another data set. It was written in 1989 and then mostly forgotten. With the reports of correlator bias, this task was revised to apply all of the data selection, calibration, and flagging options to the first input *uv* data set while averaging each baseline and correlator over all TIMERANG. The result is applied to the second data set which is read, modified, and written with no application of data selection (other than sub-array and frequency ID), flagging, or calibration. For the VLA correlator bias problem (and a similar one sometimes seen in GMRT data), the user should specify the same data set for both inputs. SOURCES should select those pointings with no significant source at the center of the field and FLAGVER should select flags for at least these sources, but all calibration should be turned off. The default subtraction operation should be selected. The new task UVDI1 was written to do a similar operation. It requires a single-source data set for the averaging and does not apply flagging or calibration to either data set. It can time-average the output difference data, however. `UVAVG` has a similar operation which subtracts a full average of a data set from itself with optional averaging. At present, this `SUBT` operation functions correctly only on single-source data, and there is some thought to removing the option when calibration adverbs are added to `UVAVG`.

FILLM

`FILLM` is the old task that converts the VLA on-line data format into an *AIPS* format. It applies to data from the now old ModComp controlled system and from the new control system (through IDCAF) as long as the old correlator is in use. At the end of 2006, it was revised to handle the data scaling difference between the ModComp output and the new IDCAF output. Two significant bug fixes were patched into the `31DEC06` release as well. One caused the loss of the first data record from the next input disk file. At best this meant simply a loss of a single integration time. But, if the mode changed at the file boundary, that change might have gone unrecognized. If the number of polarizations or IFs changed, then errors would be recognized quickly when writing the `CL` table. A lingering fear that data might have gotten mixed without recognition of a problem remains. The second "error" was a poor decision to use an embedded blank in station names for the VLA. This did not confuse *AIPS*, but other software packages were not so lucky. The names are now `VLA:_`*xxx* and `EVLA:`*xxx*, where *xxx* is the station name, such as `W1` or N72.

Changes which did not make it to patch include the addition of support for Z mode observing. In that mode, true zero-lag data are retained, offering the possibility of new tasks to re-appodize the spectra. The master pad is now correctly recognized as a valid station. EVLA antennas do not have a "front-end" T_{sys}, so the back-end one is used for them at all times. `FILLM` was changed to write the data with the "normal" *AIPS* axis order: Stokes, frequency, and IF. Previously, it wrote whatever order was convenient to the observing mode, usually frequency, Stokes, and IF, which caused trouble when comparing freshly loaded data sets to data that had had some *AIPS* processing down to them. Support was added for the ten "official" EVLA band codes and separation frequencies. The new telescopes are able to, and do, observe at frequencies which were not understood previously. The default handling of `TIMERANG` was changed to that which users now expect and the mischievous adverb `DOALL` was removed. The bad exponent message was curtailed, and a summary of bad exponents was added at the end. It was discovered that `FILLM` would load two data files into one output, without distinguishing them, even when the two were taken with different configurations. Code sensitive to any change in antenna position greater than 0.02 ns was added to prevent this. Note that this test cannot be made more sensitive for ModComp-recorded data. The antenna positions recorded by the ModComps are changed continuously for earth tides and polar wander. The routine that attempted to correct antenna locations for the shift that must occur when Pie Town is used at Q band was found to be defective. It was generalized so that it will work without reference to band.

VLANT

When an antenna at the VLA is moved to a new station, it is pressed into service after a brief check of its pointing parameters. At a later date, a significant period of time is used to observe a wide variety of calibration sources in order to determine improved estimates of the true locations of the antennas. These data are reduced by the data analysts using a procedure that invokes *AIPS* tasks `CALIB` and `LOCIT` and suitable changes are then made to the antenna database at the telescope. These changes, as increments, are also added to a hand-maintained text file available to users. The web site contains an access tool to these text files and a complicated prescription for how the user should add up corrections and apply them to his/her data. The changes were to be made, one antenna at a time, via `CLCOR` operation `ANTP`.

We suspect that users seldom did this; the corrections, while useful, were usually small enough that they were not worth the trouble for all but high-frequency data. To rectify this, a new task called `VLANT` was written. The analysts' text files for all available previous years were cleaned up to remove various formatting issues and a few obvious errors and then included with *AIPS*. `VLANT` fetches the latest year's text file from the web, if necessary, in order to have all of the analysts' recent changes. (Note that this implies that *AIPS* must be running on a machine that has web access, at least for data that require the latest text file.) Then `VLANT` performs the complicated prescription for all antennas and does the modification of the `AN` table and a new CL table for all antennas at once. Now there is no excuse for not applying the best known antenna locations to a users' data. Note, that antenna position information continues to be updated until the antenna is moved from its pad. This can be many months in some cases.

OOSUB

OOSUB is a version of UVSUB written using the object-based classes of such tasks as IMAGR. It offers the frequency-dependent options found in IMAGR to correct for primary-beam and spectral-index effects. It also has a special option not available anywhere else. This function allows the user to omit from the OOSUB all CCs that are inside the highest frequency beam, outside the highest frequency beam, inside the lowest frequency beam, or outside the lowest frequency beam. The special option will allow the subtraction of partial models to enable better imaging of the inner portions of the data and will probably have other uses when we get clever. It will be interesting to experiment with modifications of PEELR to, for example, subtract a model in a frequency-dependent manner, but add it back without the frequency dependencies.

Other *uv*-editing matters

TVFLG and SPFLG were changed to use modern rules for FLAGVER, rather than their curious rules. Now, if a flag table is used on the input, it is copied to a new output flag table and the newly-created flags are appended. A fatal error when looping over channels and IFs to apply an existing clip pattern was corrected. The error arose only when one of the channels had no data.

WIPER was changed to label sub-windows as well as those displaying all of the data. It now will display up to 2 antenna pairs contributing to the sample under the cursor, with a plus sign added if there are more than 2. It will now accept any reasonable STOKES specification, displaying all that are requested and flagging things appropriately. The handling of hour angles, elevations, azimuths, and parallactic angles was corrected.

FLAGR was changed to look for averaging intervals containing only one time (at the ends of scans) which can be reasonably included in the previous interval within that scan. Otherwise, they are flagged since they cannot have an rms. The data buffer sizes were increased to allow for four polarizations with large numbers of antennas and IFs. Other changes to improve reliability were also made.

EDITR was made more forgiving about format errors when reading user-provided numbers. This forgiveness also affects EDITA, SNPLT, SCMAP, and SCIMG.

Other *uv*-display matters

LISTR and RLDIF were changed to average all requested spectral channels in the MATX display and to loop appropriately over IF. RLDIF was corrected to use vector averaging between scans as well as within scans. LISTR's GAIN display required a correction to its format.

PRTUV was given the option to print real and imaginary parts of the visibility rather than amplitude and phase. The alternate display of random parameters was corrected and generalized.

VPLOT was given a new option 'IFRA' to plot the ratio of two IFs.

UVPLT had all restrictions on STOKES removed; all requested polarizations will be plotted together. It had corrections for VLBI to the computation of hour angle, azimuth, elevation, and parallactic angle. The display when using such axes was changed to show the usual information as well as the REFANT.

DTSUM confused antenna number with position in the antenna file. The displays of which baselines are in the data were revised to do the total summary, followed optionally by a scan-by-scan summary. More user and internal controls over the displays were added.

ANBPL computed elevation incorrectly for single-source files since the source position information was never read. This oversight was corrected.

SNPLT subtracted 6 hours erroneously from all hour angles.

Other *uv*-related matters

SPLIT could lose the value of `DOCALIB`, `DOPOL`, `DOBAND`, and `DOBL` if a source in the list had no data found. All sources later in the list would be written out, but with no calibration applied and no warnings. The code was corrected and a patch issued.

QUACK was given new options to limit its function by Stokes and IF.

INDXR was changed to work with single-source files as well as its usual multi-source files. `CALIB` will use this information to good advantage in self-calibration. `INDXR` was changed to support the new EVLA band definitions.

CALIB extended index table times by 5 seconds in each direction. This is disastrous when using a short averaging time within scans, so corrected the round-off protection to 0.1 sec.

LOCIT was given the option of using the difference in the phases of the 2 IFs to solve for antenna positions. This means that baseline errors are multiplied by the small frequency difference of the 2 IFs rather than the full observing frequency. An optional slope in phase with time was also added. All of this was needed to find the VLA master pad!

VBGLU was improved to reformat flag tables for the new IF nomenclature. `VBGLU` was changed to refuse to glue multi-frequency ID data sets. This is better than making a mess of the job. Gluing of the `STATE` column in `PC` tables was corrected. A multi-dimensioned character column is confusing to FITS tables, or at least to *AIPS*.

CVEL had a programming error cause `CALINI` to issue numerous warnings erroneously and another error that could cause an abort (with some compilers) before the extension files were copied.

BLCAL is now recommended with some VLA data. It was corrected to work with normal multi-source data sets. It did bad things when there was non-zero delays in the `CL` table due to a misunderstanding about units. The task was also changed to use dynamic memory instead of rather small buffers. Fixed scaling of calibrator source models to be properly IF dependent. (This change was also made a wide variety of other tasks.)

VLBAUTIL was changed to try a variety of download methods to fetch files from the web; `wget` is not universally available. It was also changed to split frequency IDs before calling `MSORT`. That task could take a semi-infinite time to run when two frequency IDs observed at the same time were appended. Such data usually need to be separated, then sorted and `VBGLU`ed.

UVFIX was given the option of suppressing differential aberration in its computations. An error of the reference channel in frequency was made for uncompressed data when the source position was changed.

CLCOR had a second-order error in phase corrections for a change in source position which has been corrected.

SMOOTH was left out of 17 tasks that otherwise apply calibration. The oversight was corrected.

FITLD was changed to support bandpass tables within the IDI convention.

MULTI used parameters to the precession routine other than those used normally in *AIPS*. The apparent coordinates in the output source table were somewhat affected.

Miscellaneous

New verbs

Four new, related verbs have been written. They are named VLA, EVLA, VLBA, and HSA and place a temporary numeric array on the *POPS* stack for processing by other verbs. The verbs look in the specified antenna file to make a list of the antenna numbers that match (or do not match) the specified array. The temporary numeric array is a new concept in *POPS* and required a number of modifications to the language and its fundamental operators. Verbs such as `MAX` and `PRINT` can now handle the output of such verbs. There are, however, a number of limitations to the use of these verbs, the worst being that one cannot use two of them in the same command. If you want to set an adverb array to, for example, the list of EVLA antennas, you must include an equals sign; thus `ANTENNAS = EVLA`.

Other matters

TABED was changed to default the output file name parameters individually to those of the input. An inadvertent `OUTDISK` with otherwise blank `OUTNAME` sent the output table to very unexpected places.

DFQID failed to renumber frequency IDs in the tables.

DQUAL failed to renumber the sources in tables.

FXTIM failed to correct the `TIME` and `TIME RANGE` in tables.

TAPLT was corrected to recognize blanked values. The scaling was changed for binned plots to ignore empty bins and plot them at the bottom anyway. The Y function string displayed was corrected.

KNTR was changed to allow `ZINC` less than zero to plot the planes in the opposite order. Error reporting, especially for crazy polarization lines, was improved.

Analysis

CUBIT

Judith Irwin of the University of Toronto wrote `CUBIT` quite some time ago to fit spectral-line cubes with models of density as a function of radius in, and height above, a galactic plane and of velocity as a function of radius. She has continued to develop the code and help file over the years and has now kindly made it available to all *AIPS* users. We have modified the code to modernize its structure and to replace modest fixed arrays with dynamic memory, allowing cubes of any size to be fit. This task is not easy to use — there are a great many parameters to fit and it takes patience to find good minima in the very large Chi-squared space. The results are rather more general than those found fitting solely moment images. If you use this task to analyze your data cube and make reference to the results in a paper, you should reference the original paper describing this task: Irwin, Judith A. 1994, "Arcs and bridges in the interacting Galaxies NGC 5775/NGC 5774," ApJ, 429, 618–633.

Other analysis matters

FLATN was changed to allow it to make images of the expected noise or weight (one over noise squared) from mosaic observations. Repaired bug which caused the `NOISE` adverb in mosaicing to be ignored, leaving all pointings with the same basic weight. `FLATN` will now use the header parameter `ACTNOISE`, if present, as the default for `NOISE`.

VTESS was changed to test whether the incoming images for a mosaic are on the same geometry as required. Changed `UTESS`, `LTESS`, and `STESS` to apply these same tests. Corrected a bug in `STESS` and added a note to its help file pointing out that `FLATN` now does its job without all the problems with image geometry.

SAD was enhanced to be able to use the optional noise image when selecting the islands to be fit and during the decision process in which fits are accepted or rejected. Previously, the noise image was only used to modify the uncertainties assigned to the results of the fit.

SMODEL was applied without the $w \times z$ term which is important at large angles. The extended source portions of `SMODEL` were also ignored by low-level OOP routines.

Models of calibration sources must be scaled by the source total flux, which is different for each IF in the data. `CALIB` did this correctly, but most other model application tasks ignored this nicety.

UVCON was corrected for problems with its computation of elevation and its creation of antenna files.

Imaging

`IMAGR`

The TV menu was rearranged to put the choices that stop things well away from the choices that are frequently used. This should reduce the premature terminations. Added two new TV options - to turn off Cleaning of a facet now and to turn it back on. Changed the beam histogram computation to avoid edges and corners which can be pathological due to accumulated round-off errors. Moved the forcing of `DO3DIM` to true for `OVERLAP=2` mode to before the images are created. It is too late after that. Fixed the positioning of the inscribed circle which may be drawn optionally to guide the eye in setting boxes. Cleaned up the handling of the on-line help which had stopped working for some options and were too demanding on the programmer for the ones containing field numbers.

SETFC had an error in the formula for phase error which was corrected in the help file and code. The output is unchanged because the default phase error was changed accordingly. Fixed errors handling a radius of zero. Changed the channel to avoid channel 1 which is often fully flagged. Changed the round up levels to recommend larger images rather sooner.

General and programming matters

AIPS does much of its high-performance computing with a cpu-based emulation of an array processor. General mathematical routines function on data located in a large memory accessed via pointers. Such routines are usually highly optimized by compilers. Previously, the size of this memory was determined at compile time and set by the local *AIPS* Manager. A fundamental conflict arose in choosing this size between those people at a site with older, small-memory computers and those with large problems to solve. Furthermore, since the size of the memory was set independent of the problem, the programmer had to write algorithms which could adapt to almost any size of memory. Such algorithms tend to be limited and/or much more difficult to write.

In `31DEC07`, the pseudo-AP has been changed to use dynamically allocated memory. The programmer specifies the amount of memory needed when the AP is allocated by `QINIT`. Pointers in regular code remain normal integers since we assume that we will not allocate more than 8 Gbytes. However, the actual subscripts to `APCORE` are now required to be `LONGINT`s which are the sum of an offset called `PSAPOF` and the calling routine's pointers. Computers which use 8 bytes for address pointers in C require us to use `INTEGER*8` "`LONGINT`s." The pre-processor automatically handles the conversion of `LONGINT` in the *AIPS* Fortran code into the form needed by the local computer.

We had hoped that this change would improve performance by allocating more memory in many cases to avoid the use of disk inside algorithms. The standard `Y2K` tests, however, showed no change in performance, suggesting that 20-Mbyte APs are already adequate for these tests. Linux disk I/O does a great deal of in-core caching as well, which would reduce the differences bewteen "disk" and in-memory algorithms. The main purpose of this change was to allow for the creation of new algorithms which would be easier to create and more efficient by never invoking disk files.

MNJ reports now contain a list of files noted by the `cvs` update, with a character showing whether the file was new, updated, different at the remote site, etc.

install.pl was changed to cause `cvs` to ignore more of the files it should ignore in its reporting. The options of the `rsync` calls were altered to improve reliability. Calls to `chgrp` were added to change the group ownership of files to that requested by the installer.

Servers for messages and Tektronix plot emulation are programs that run inside an `xterm` or other suitable window program. The binary releases require the location of supplied libraries when these programs start in the spawned `xterm`. The files `UNIXSERVERS` and `XASERVERS` were changed to have shell- and architecture-dependent case statements to try to set this information where it can be used. The situation with these servers seems to have improved with this addition, but mysterious troubles continue to be reported.

Patch Distribution for 31DEC06

Important bug fixes and selected improvements in 31DEC06 can be downloaded via the Web beginning at:

`http://www.aoc.nrao.edu/aips/patch.html`

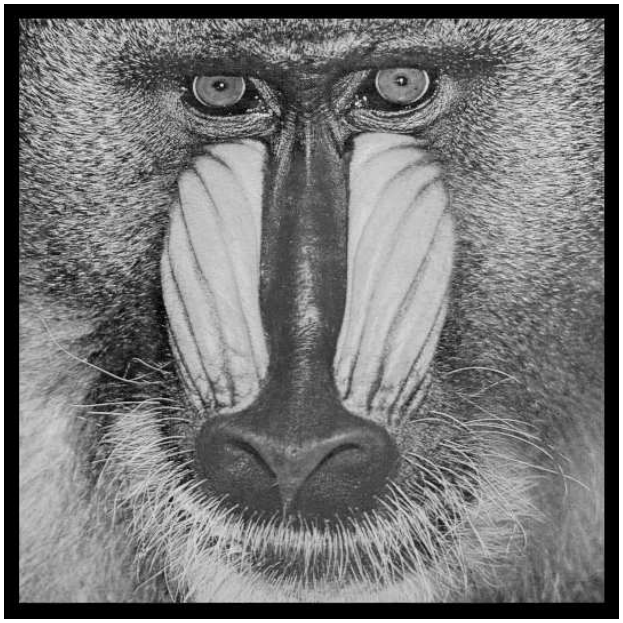
Alternatively one can use *anonymous* `ftp` to the NRAO server `ftp.aoc.nrao.edu`. Documentation about patches to a release is placed on this site at `pub/software/aips/`*release-name* and the code is placed in suitable subdirectories below this. As bugs in 31DEC07 are found, they are simply corrected since 31DEC07 remains under development. Corrections and additions are made with a midnight job rather than with manual patches. Since we now have many binary installations, the patch system has changed. We now actually patch the master version of 31DEC06, which means that a MNJ run on 31DEC06 after the patch will fetch the corrected code and/or binaries rather than failing. Also, installations of 31DEC06 after the patch date will contain the corrected code.

The 31DEC06 release had a number of important patches:

1. CALIB handled scan times badly when averaging within a scan *2007-01-02*
2. UPDCONTROL in the MNJ used obsolete syntax for `sort` *2007-01-10*
3. UVFIX did not contain the latest leap second *2007-02-27*
4. CLCOR operation SUND did not work *2007-02-27*
5. VBGLU did not handle the PC table STATE column correctly *2007-02-27*
6. CVEL had a bad call sequence which could cause an abort *2007-02-27*
7. SNSMO had a bad call sequence which could cause bad smoothing of rates including flagging them *2007-04-26*
8. UVFIX had a frequency error for uncompressed data only and CLCOR had a minor conceptual error both affecting phases after a position shift *2007-04-26*
9. BLCAL and UVFND set the integration time to one day, causing bad amplitude calibration when there were rates and delays *2007-04-26*
10. `aips.l` man page was lost *2007-05-04*
11. FILLM skipped a record at ends of file which could lose a data sample and possibly cause confusion if the mode changed *2007-05-24*
12. SPLIT lost the calibration flags when a source was not found so that later data did not have calibration applied *2007-06-10*
13. SNPLT lost data from phase plots of PC tables due to failure to check for wraps and got hour angles wrong by 6 hours *2007-06-14*
14. FILLM used a blank in the middle of some station names, confusing other software packages *2007-06-16*

AIPS Distribution

We are now able to log apparent MNJ accesses and downloads of the tar balls. We count these by unique IP address. Since dial-up connections may be assigned different IP addresses at different times, this will be a bit of an over-estimate of actual sites/computers. However, a single IP address is often used to provide *AIPS* to a number of computers, so these numbers are probably an under-estimate of the number of computers running current versions of *AIPS*. In 2007, there have been a total of 750 IP addresses so far that have accessed the NRAO cvs master. Each of these has at least installed *AIPS* and 186 appear to have run the MNJ on 31DEC07 at least occasionally. During 2007 more than 180 IP addresses have downloaded the frozen form of 31DEC06, 117 in binary form, while more than 517 IP addresses have downloaded 31DEC07, 346 in binary form.



June 30, 2007

AIPSLETTER
National Radio Astronomy Observatory
Post Office Box O
Socorro, NM 87801-0387
USA

FIRST CLASS

To:

DATED MATERIAL-DO NOT DELAY