// AIPSLETTER

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A newsletter for users of the NRAO
Astronomical Image Processing System

Written by a cast of *AIPS*

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The Good News ...

The 15JUL94 release of Classic *AIPS* is now available. Contact Ernie Allen at any of the addresses given in the masthead to obtain a copy. As of this writing, 80 copies of the 15JAN94 release have been given out electronically (32 tar.Z, 31 tar.gz) or on magnetic tape (10 8mm, 4 4mm, 2 QIC, 1 9-track). A new port to Silicon Graphics computers was developed for this release, and the magnetic-tape portions of the ports of *AIPS* to DEC's alpha computer (OSF/1 operating system) and the Linux system on PCs were debugged. In addition to the ports, we have written a number of new tasks, enhanced the transmission and calibration of VLBA data, and improved the automatic source finding and fitting task SAD. The large job of rewriting and updating the *CookBook* was begun, with the new and remaining old chapters being made available on-line through the World-Wide Web.

The NRAO is advertising a support scientist position in the AIPS++ group at the Array Operations Center in Socorro, New Mexico. If you are interested, or know anyone who might be interested, please contact Ina Cole at the NRAO in Socorro (505–835–7309 or icole@nrao.edu). The position we advertised in the Classic *AIPS* group has been filled by Athol Kemball, an expert in VLBI spectral-line polarimetry and an experienced *AIPS* programmer. We would like to thank all those who applied for the position. The high caliber of the applicants was very gratifying.

The IAU FITS Working Group approved the binary tables extension to the FITS format conventions on June 10, 1994. At long last, this gives official approval at the highest possible level to the tables format we have been using in *AIPS* since about 1987. This format was designed initially by Bill Cotton to cope with the need for greater efficiency than one could obtain with ASCII tables and with the need for columns in tables to contain arrays as well as scalars. Inside *AIPS* these tables have been called A3DTABLE, but the new official name is BINTABLE. (This change is the current reason for the adverb DONEWTAB in FITTP since BINTABLE is understood only by the 15JAN94 and later versions of *AIPS*.)

The DDT test has been run on a Silicon Graphics Indigo 1 computer (33 MHz MIPS R3000 cpu, 16 Mbyte memory) and an Indigo 2 (150 MHz MIPS R4400 cpu, 32 Mbyte memory) by Jeff Pedelty (GSFC). The AIPSMarks$^{(93)}$ achieved were **1.18** and **2.66**, respectively. Both of these should increase with larger memory and SCSI-2 fast/wide disks. A new record AIPSMark$^{(93)}$ of **3.89** was acheived on a DEC Alpha 3000 model 600 with 128 Mbyte of memory, 250 Mbytes of swap space, and OSF/1 version 1.3. The tests were carried out by Scott E. Aaron and Jing Ping Ge of Brandeis.

... and the Bad

Improvements for Users in 15JUL94

VLBI data processing

Two of the new tasks in `15JUL94` are designed to correct format limitations in VLBA data. `VBGLU` is used to bind together MkIII format VLBA data which were correlated in more than one pass. The result is a data set with a significant number of IFs. `FXPOL` is a task to correct the *AIPS* header and tables for dual-polarization VLBA data sets. The correlator treats the two polarizations as separate IFs, while *AIPS* would prefer to treat them as separate Stokes. `FITLD`, which translates correlator FITS files into *AIPS*, was improved in a number of ways. The format of the `IM` table was updated, a progress message giving source name and times was added, user control over the frequency tolerance for file concatenation was added, and suitable cleanup operations were added to remove unused entries in tables and empty data files. Task `INDXR` was enhanced to use the `IM` table if available when creating a new base calibration table (`CL` table version 1).

The task which solves for residual delays and rates, `FRING`, received considerable attention. Bugs were fixed which would (1) stop the task because the (reported) solution interval of 0.0 was too large, (2) cause bad solutions due to aliasing in default (Nyquist) search windows, (3) bias solutions toward zero in narrow search windows, and (4) stop the task for singularities in the least-squares fit which can actually be managed. Warning messages about failed solutions were also added. `ANCAL`, which enters system temperature and antenna gain corrections in the `CL` table, was enhanced to read in system temperatures for more IFs and to read in antenna temperatures for many more times for each antenna. The option that allows users to specify system temperatures in arbitrary order (`INDEX`) was made operational with several indexing errors corrected. `ACFIT`, which determines antenna gains from spectral-line auto-correlation data, was corrected for an error in comparing the times of the template to the specified time range and was enhanced by new adverbs to allow the user to specify the system temperatures for each IF in the template spectrum. Shifts in the fringe-rate spectra plotted by `FRPLT` were corrected. `WTMOD` was deterred from modifying weights back to positive (no longer flagged) which it was doing in some modes.

UV data calibration and manipulation

`15JUL94` *AIPS* will now support 90-antenna arrays rather than mere 45-antenna arrays. This allows *AIPS* to support the new real-time solar imaging array built by the Japanese. The gain normalization was found to have have two errors: unsampled antennas were included (at gain 1.0) in the average of the gains (at least when `APARM(9) = 1`) and the square root of the correct factor was applied to the data. Significant bugs in the handling of parallactic angle were found affecting VLBI polarization corrections and the `RAPR` option in `PCAL`. This may explain why the linear approximation solutions did not seem to work well. Significant bugs were also corrected throughout the calibration package in the deselection of antennas, sources, and calibrators. There were modes in which things deselected at the beginning of the task would become the only things selected at later stages. Several tasks were changed to make sure that data in tables are consistent with the data in the headers. `SPLIT` and `DBCON` were changed to change the frequency in the antenna table in the same way that the frequency in the header was changed. `SPLIT` was also changed to fix the `FQ` table for channel averaging and to remove the polarization correction from the antenna table after applying it to the data. This is intended to keep the programs from applying the same correction twice. `UVCOP` now removes unused sources from the output source table.

A bug in `CALIB` caused L1 solutions to fail if one of IFs had no data for an antenna present at other IFs. `UVFIX` was improved to make all phase corrections functions of frequency and to include leap seconds by default. A source-position correction option was added to `CLCOR` and its internal units for the zenith angle gain correction were made consistent with the documentation. `UVFLG` was changed to be able to read more flagging commands and to alter user-specified times by only 0.5 seconds and then only when the two ends of a time range are equal. `LISTR` will now include auto-correlation data, if present, in `MATX` listings. `UVFND` now tests for data flagging in all cases. The interference detection task `RFI` was improved to catch interference of steady amplitude and variable phase and was corrected in its handling of the amplitude-proportional part of the cutoff level. `SOLCL`, which applies solar system temperature measurements to the calibration table, was improved to avoid writing over `CL` table one and make a `CL` version two automatically when needed.

Imaging

The relatively new imaging and deconvolution with corrections task `WFCLN` required a number of corrections for this release. The default handling of clean boxes was not as a user would have it and the meanings of the channel selection and averaging adverbs were not consistent throughout the task. The option to restart with a pre-existing work file was turned off since it appears that it can never be done in a quick mode and it may be the cause of a number of mysterious failures. The imaging task `HORUS` was found to be using only one IF by default, which was a (nasty) surprise to continuum users. It was changed to do `SUM` mode on continuum data by default, to inform users whenever their data selection adverbs are overridden, and to prevent a failure due to channel-based data editing.

A minor bug in `SUBIM` causing it to fail to correct the data extrema in the output header was fixed. Fourier-transform task `FFT` was corrected to stop trashing rectangular images. `VLABP`, which applies wide-field instrumental polarization corrections to VLA snapshot images, was fixed to use the correct geometry in its scratch files and to write its output all in the correct place even when some of the input adverbs have default values. `OHGEO`, which corrects and alters image geometry, had a serious bug corrected. To quote the `CHANGE.DOC` entry: "Apparently correct behavior in the distant past is mystifying."

Holographic imaging of antenna surfaces is supported in *AIPS* by two tasks, `UVPRT` which translates the pseudo-*uv* data into text files and `HOLGR` which reads the text files, grids the data, solves for offset of the antenna vertex plus corrections for pointing, focus, and feed offset, and Fourier transforms the data to make images of the telescope. These programs were substantially revised for this release. `UVPRT` was given a new holography mode with a number of user-controlled and automatic data editing functions to limit the data written to the text files. `HOLGR` was changed to offer new tapering options, to do uniform weighting by default, to compute the weight and observation beam images from all of the weighting and tapering, to ignore samples outside the grid, to parameterize the image dimensions and to use equivalences to avoid using too much virtual memory, to give the user some control over the resolution of the image of the telescope's beam pattern, and to allow images up to 512 on a side.

Image analysis and display

Task `SAD` is intended to "search and destroy" Gaussian components in images. It encountered the first real image from the VLA D-Array Survey and received a variety of improvements to allow it to cope. Corrections were made in the units of the clean beam position angle, in disk access while subtracting components, in the estimate of the error in the position angle, and in the corrections of the component widths and position angle for projective geometry. Solutions were made more reliable by changes to fit the components in descending flux order, to limit initial guesses to reasonable widths, and to determine the extrema and rms of the residuals around each component only after all components are subtracted. New options were added to include a flux-dependent component in warning levels and to allow the user to specify conditions under which components are rejected and to display information about those rejections. Anticipating spectral-line (or time domain) usage, a column for data cube plane number was added to the model fit table file. A new task called `MFPRT` was written to display the contents of the model fit file in a format suitable for certain non-*AIPS* modeling software.

To provide external software with better access to values from *AIPS*, task `IMEAN` was changed to write histogram values into its output text file and task `SLICE` was changed to write slice values to a text file. Task `IMERG` uses an interesting FFT-based algorithm to merge images of differing resolution. It was corrected to remove several coding errors which prevented it from doing anything. For single-dish users of *AIPS*, task `PRTSD` was corrected in its handling of spectral channels (it applied `BCHAN` twice) and in its formats. `IMLIN`, which fits and removes "continuum" from data cubes, was corrected to handle missing data gracefully, a condition which arises naturally in single-dish imaging.

A new display verb, `TVSTAR`, was written to plot positions from a "star" (`ST`) file directly on a TV. The color PostScript task `TVCPS` was enhanced with options to invert the coloring, to add a user-specified string at the bottom of the picture, and to read the data from disk rather than from the TV (while still using the TV transfer functions). Both it and `LWPLA` were corrected to write only correct encapsulated PostScript. Three-color display tasks `TVHUI` and `TVRGB` were corrected in their enhancement algorithms, in their image coincidence checking, and in their handling of blanked pixels. `KNTR`, which plots multiple contour drawings per page, was corrected to plot the specified axis labeling type.

Magnetic tapes

Because people are now transferring all of their old data tapes to a relatively few DAT or Exabyte tapes, we have improved PRTTP to attempt to report on their contents. In particular, it was changed to skip over null files (if requested), to report on unknown formats, to write any error messages into the print file as well as the message file, to keep going as long as possible despite errors in data, to write something to the output text file (on PRTLEV = -3) for every format, and to handle large numbers of sources in VLA archive files. The tape-mounting software was masking errors from higher-level code, causing the tape dæmon TPMON to think tapes were mounted when they were not.

Tape routines were tested on a variety of new computer systems. Improved low-level routines were developed for Sun Solaris, DEC, and Linux. The latter two are "byte-swapped" architectures. Errors translating ModComp and FITS-standard floating-point numbers to local floating point were discovered on these while running FILLM and FITLD, respectively. FILLM was also corrected to accept an "end-of-information" return code as a signal to quit normally; it was only accepting end-of-file. A bug in the Sun-specific low-level code caused users at the NRAO to write tapes with no filemarks between FITS files (over a two-week period). Task TCOPY was enhanced to recognize and, optionally, correct this problem.

Miscellaneous changes of interest to users

Other corrections and improvements made to *AIPS* for the 15JUL94 release include:

POSSM Changed task to add an option to reverse the direction of the plot added, to fix a one-channel offset in the axis labeling (yet again), and to fix a weighting problem for IFS > 1.

CHKNAME New verb to determine whether the file specified by INNAME, *et al.* exists and to return a status adverb. It should be useful in large procedures.

EXTDEST Changed to require confirmation before deleting version 1 of either a CL or an HI file. One should almost never do either of these.

TELL Batch tasks may now actually receive parameters from the TELL verb. Thus, an interactive user can alter the parameters of, or request a graceful termination of, his/her batch tasks.

helps Updated the general help files to point at ABOUT and continued to keep current the files used by ABOUT and APROPOS.

Improvements Primarily for Programmers in 15JUL94

Ports to new operating systems

The new operating system for this release is Silicon Graphics. We extend our thanks to Jeffrey A. Pedelty of the Goddard Space Flight Center for doing the initial port and then making his computer available to us for later testing. It is a relatively standard Bell port with a few differences. In particular, clock ticks are represented by a different standard symbol (HZ) and value (100), the Unix pipes routine popen has a non-standard type requiring a cast to the usual type, and terminal characteristics are set by methods other than those used previously. So far as we know, all of the port is working, but we have not tested the magnetic tape routines. These routines have been brought up to the form and standards of the best supported systems using the SGI includes and data structure. However, they are likely to have minor problems and will probably appear in due course in the patch area for 15JUL94.

Miscellaneous changes for programmers

Byte-swapped computers are making a renaissance, so programmers should remain aware of the difficulties they pose and the *AIPS* parameter (BYTFLP in Fortran, Z_bytflp in C) carried around to describe byte and word swapping. The relatively generic routines for converting FITS-standard (ZR64RL) and ModComp (ZRM2RL, ZDM2DL) floating-point binary numbers to local format all had to be corrected for this release.

Magnetic tapes remain a software porting nightmare. Most versions of `ZTAP2` were improved for this release, removing excess operations. This can be dangerous as EOFs were removed excessively for 2 weeks on Suns. The Solaris Z routines were upgraded to current standards. The DEC versions of the tape routines were made to work, corrected to handle `errno` 28 which DEC uses for EOI, corrected in their error handling on back-files, and enhanced to use another `ioctl` to obtain additional status information. The Linux Z routines were also made to work. In that case, there are a number of caveats. Linux systems are really opposed to writing more than one file and virtually require that to be at the previous end of information. By adding a variety of slow and normally un-needed tape operations, we have been able to overcome most of the limitations of the Linux tape driver. Unfortunately, we cannot prevent it from writing an extra end of file whenever a tape opened for write is closed. Fortunately, in *AIPS*, such closes only come when the tape is actually at EOI already. If we rewound the tape before the close, Linux would put an EOF at the start of the tape, destroying its entire contents. As it is, Linux users should either avoid `DOEOT TRUE`, or learn to tolerate a large number of null files on their tapes.

The area of printing also received some attention for this release. To remove our dependence on non-standard filters to convert Fortran print files to plain text and then to PostScript, we have written our own filter `F2PS` to convert Fortran or plain text to PostScript. We have also written a filter called `F2TEXT` to convert Fortran output to plain text printers. These filters take, as an argument, the number of lines per page assumed by the *AIPS* task and attempt to do something reasonable with it. *AIPS* deletes print and plot files from the `/tmp` area after a delay interval sufficient to get the file plotted. Since "sufficient" varies, we changed the system to make this interval available to the *AIPS* Manager via `SETPAR`. The delay may then be set and changed simply for all hosts in your network together or individually.

Other matters of interest to programmers in `15JUL94` include

large disks Several versions of `ZCREA2` were fixed to avoid integer overflow problems on disk systems larger than 2 Gbytes. Disk free space can no longer be measured in bytes!

disk access The disk-use permission parameters have been extended to include *AIPS* disk 1. Previously, all users were allowed to read and write disk 1, but the new network-wise *AIPS* allows users to define an otherwise forbidden disk as disk 1. *AIPS* user number 1 now has privilege on all disks and no longer needs to be listed in `$NET0/NETSP`.

standards One of the compilers has forced us to require that commas separate all format items in `FORMAT` statements. This is the ANSI standard, but most compilers have been forgiving.

image size The verbs `GO`, `INPUTS`, and friends were changed to apply an upper limit of 8192 for image corners, ignoring any limits typed in the help files. Code should anticipate images of this size in the future.

AIX The print routines `ZLASC2` and `ZLPCL2` were not interpreting error code from pipes correctly on IBM systems. This led the `/tmp` area to overflow.

swap space *AIPS* tasks are now requiring large amounts of swap space, partly from large arrays of their own using. When "shared libraries" are used, however, the swap requirements increase to include all subroutines in the shared libraries. Some attempts to remove subroutines from libraries has been made and other attempts should be considered. Large buffers should be coded into tasks and passed down to subroutines. Otherwise those buffers are included in the swap-space requirements of all tasks that use that subroutine library. The current swap-space requirements for `TVFLG` under Sun OS 4.1.2, for example, are 13.24 Mbytes when linked statically and 24.76 Mbytes when linked with shared libraries. For `FITTP`, which uses neither the TV libraries nor the calibration parts of `$APLNOT`, the difference is even more extreme, with the static binary requiring only 0.85 Mbytes while the dynamic binary requires 21.4 Mbytes. These numbers show that the saving in disk space for the load modules, currently about 50 Mbytes, is less than the amount of extra swap space required for *AIPS* on *each* workstation in the system.

AIPS Publications and the World-Wide Web

There has been a virtual explosion in the use of the *World-Wide Web* (WWW) protocol on the Internet. It is a method for sending hypertext over the network and has been made easy to use by clients such as *NCSA Mosaic* and *Lynx*. NRAO is among the many institutions which now offer informative "home pages" and networks of additional information. The NRAO home page is at the Universal Resource Locator (URL) address

`http://info.aoc.nrao.edu/`

This page can lead you to information about each of the NRAO's sites and telescopes, library system, major new initiatives, software packages, phone directory, and Newsletter as well as information about other astronomy resources on the Internet and about *Mosaic* and its mark-up language called `html`. The *AIPS* group home page may be found from the NRAO home page or addressed directly at URL

`http://info.cv.nrao.edu/aips/`

This page points at basic information ("What is AIPS?" and a "FAQ"), news items about *AIPS* (such as "15JUL94 Release imminent …"), the PostScript text of recent *AIPSLetter*s, patch information for all releases after `15JAN91`, information about known bugs, the latest *AIPS* benchmark data from various computer systems, copies of `CHANGE.DOC` for every release since `15JAN90`, and *all* relevant *AIPS* Memos, *every* chapter of the *CookBook*, and all recent quarterly reports to the NSF. We recommend that you check this area occasionally. As we correct and update the *CookBook* and as we write new *AIPS* Memos and reports, we place the documents in PostScript forms in the area used by WWW and we have the `html` listings, indices, tables of contents, and the like updated to reflect the additions. In this way, you do not have to wait until `15JAN95` to get the latest *CookBook* chapters. We expect, for example, to have revised versions of the Spectral-line and VLBI chapters in the relatively near future.

Below is a list of the latest *AIPS* Memos. Memos 86, 87, and 88 are new in this *AIPSLetter*, although 88 is simply a TEX-set and slightly updated version of several old internal memos.

Memo	Date	Title and author
84	93/11/12	A Proposed Package to Support the Use of the X Window System in AIPS Tasks Chris Flatters, NRAO
85	94/02/01	DDT Revised and AIPSMark$^{(93)}$ Measurements Eric W. Greisen, NRAO
86	94/03/16	Wide-field Polarization Correction of VLA Snapshot Images at 1.4 GHz W. D. Cotton, NRAO
87	94/04/05	The NRAO *AIPS* Project — a Summary Alan H. Bridle, Eric W. Greisen, NRAO
88	94/05/16	The *AIPS* Gripes Database W. D. Cotton, Dean Schlemmer, NRAO

A heavily revised edition of the Memo on Object-Oriented Programming in *AIPS* is available as file `AIPSOOF.TEX` and, in PostScript form, as `AIPSOOF.PS`.

Since some Memos are not available electronically and others do not yet have computer readable figures, you may wish to write for a paper copy of these. To do so, use an *AIPS* order form or e-mail your request to aipsmail@nrao.edu.

To use `ftp` to retrieve the Memos, *CookBook* chapters, etc.:

1. `ftp baboon.cv.nrao.edu` or `192.33.115.103`
2. Login under user name anonymous and use your e-mail address as a password.
3. `cd pub/aips/TEXT/PUBL`
4. Read `AAAREADME` for more information.
5. Read `AIPSMEMO.LIST` for a full list of *AIPS* Memos.

AIPS Memos from Number 65 through 88 are present in this area as are Numbers 27, 33, 35, 39, 46, 51, 54, 61, and 62. We have been filling in this list gradually, by finding and fixing old files in other areas of the authors' disks, by scanning in text and figures, or by retyping text and redrawing the figures. The

*AIPSLetter*s from 1991 through the present are also available in this area. Many of the Memos are in both TEX and PostScript forms, with the TEX ones stored in a subdirectory called `TEX`. Note that many, if not all of these may be found on your home *AIPS* system in an area called `$AIPSPUBL`. All Memos are available in paper form from Ernie Allen at the addresses in the masthead.

The latest version of the *AIPS CookBook* is also available (in the form of PostScript files) in this area. Initially the chapters from the 1990 version of the *CookBook* were placed in this area; whenever one of these chapters is updated, the latest version will be available immediately in this area. Updated so far are chapters 1 (Introduction), 2 (Starting Up *AIPS*), 3 (Basic *AIPS* Utilities), 4 (Calibrating Interferometer Data), 15 (Current *AIPS* Software), and Z (System-Dependent *AIPS* Tips). Chapter 10 (Spectral-Line Software) is nearly ready as well. The remaining old chapters were revised to include figures in the PostScript and improve the typesetting, but are full of outdated information in addition to the good stuff.

Patch Distribution

Since *AIPS* is now released only semi-annually (or even less frequently), we make selected, important bug fixes and improvements available via *anonymous* `ftp` on the NRAO Cpu `baboon` (`192.33.115.103`). 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. (The patches and their documentation are also available on-line via the World-Wide Web.) Reports of significant bugs in `15JAN94` *AIPS* were more numerous than recent previous releases. The documentation file `pub/aips/15JAN94/README.15JAN94` mentions the following items:

FRING `FRING.FOR` was corrected to be consistent in its use of buffers and to avoid telling the user incorrectly to use a `SOLINT` of 0.0.

`FRING.FOR` was corrected to avoid aliasing in the default (Nyquist) search windows. This aliasing appears to have been responsible for bad solutions for residual delay and rate.

`FRING.FOR` was corrected for a bias toward zero in the solutions for delay using narrow search windows. This caused non-closing errors in the amplitudes degrading the dynamic ranges of the resulting images.

ANCAL `KEYIN.FOR` was changed to increase the line length in text files. This is needed in `ANCAL` to read $T_{\rm sys}$ information for large numbers of IFs.

`ANCAL.FOR` was corrected for a number of indexing errors in the processing of $T_{\rm sys}$ and $T_{\rm ant}$ entries. `ANCAL.HLP` was corrected to fix misleading information about $T_{\rm sys}$ groups.

SPLIT `SPLIT.FOR` was changed to keep frequencies consistent in all parts of the output (the antenna tables were not changed previously) and to reset the polarization corrections to prevent them from being applied twice.

MX `MX.FOR` was corrected for a data-selection bug in making spectral-line images while "averaging" multiple IFs. The wrong data were selected in all but the first output channel. Fortunately, this is not a likely mode of imaging.

FFT `FFT.FOR` was corrected to stop mangling rectangular images.

KNTR `KNTR.FOR` was corrected to use all the input adverbs and to do the desired type of axis labeling.

true color `TVHUI.FOR` and `TVRGB.FOR` were corrected to use the TV cursor for image enhancement in the usual way, to be more correct and complete in checking image alignment, and to be more forgiving about blanked pixels.

IMERG `IMERG.FOR` was not previously able to run.

PRTSD `PRTSD.FOR` was corrected to display the requested channel (it was offsetting twice) and to improve minor formatting problems.

FILLM `FILLM.FOR` failed to test for end-of-information, depending on end-of-file only. SUN returns EOI for double end-of-files on 9-track tapes, leading to an infinite loop of error messages.

PRTTP PRTTP.FOR was enhanced to handle null files, to do something useful with unrecognized formats, to force all error messages to the printer file, to try to continue despite data-format errors, and to be rather more bomb proof in general.

DEC ZTAP2.C, ZTPWA2.C, and ZMOUN2.C for DEC Ultrix and DEC Alpha systems only were changed to recognize beginning and end of tape correctly and to do a few other things better. Affects all tape tasks (including AIPS), but only for DEC systems.

DEC, PC ZDM2DL.C and ZRM2RL.C were corrected to run correctly on byte-swapped (little-endian) computers. FILLM.FOR was corrected to assure correct alignment of buffers.

big disks ZCREA2.C for several systems was changed to handle disk systems with more than 2 Gbytes of free space. There was no problem for more reasonable systems and in some of other versions of ZCREA2.

printing ZLASC2.C and ZLPCL2.C did not work correctly on IBM AIX systems, causing /tmp to fill up among other things.

HP LIBR.DAT for HP systems only needed a small addition in order to link edit the $AIPNOT area correctly.

Note that we did not revise the original 15JAN94 tape or tar files for these patches. No matter when you received your 15JAN94 "tape," you must fetch and install these patches if you require them. See the 15APR92 *AIPSLetter* for an example of how to fetch and apply a patch. Information on patches and how to fetch and apply them is also available through the World-Wide Web pages for *AIPS*. As bugs in 15JUL94 are found, the patches will be placed in the ftp area for 15JUL94. As usual, we will not revise the original 15JUL94 tape or tar files for any such patches. No matter when you receive your 15JUL94 "tape," you must fetch and install these patches if you require them.

CookBook Update Begun

The *AIPS CookBook* was last updated for the 15OCT90 release. Because a lot has changed in *AIPS* since then, we have decided to upgrade the *CookBook*. We are doing this one chapter at a time and are making each chapter available via the World-Wide Web as soon as it is ready. For details of the Web, see the publications article in this *AIPSLetter*. The chapters changed so far are

- 1 — *Introduction* — New sections giving a project summary and a diagram of the structure of *AIPS* were added.
- 2 — *Starting Up AIPS* — Changed to describe workstation use, *AIPS* in networked environments, and managing the TV server XAS.
- 3 — *Basic AIPS Utilities* — Updated information about history files and disk allocation, added ABOUT and APROPOS to the help section, moved and updated tape mounting, and added a discussion on external disk files (Fits, text, ...).
- 4 — *Calibrating Interferometer Data* — With much help from Rick Perley and Alan Bridle, rearranged and corrected everything, adding a substantial discussion of when and how to edit and bringing the description of TVFLG up to date including a picture.
- 15 — *Current AIPS Software* — Replaced old lists with new ones produced for the ABOUT verb.
- Z — *System-Dependent AIPS Tips* — Replaced with whole new discussions including color printers, screen copying, film recorders, workstation environments. A method for people to have NRAO make slides for them is described.

There exist drafts of both Chapters 10 *Spectral-Line Software* and 11 *Reducing VLBI Data in AIPS* which will be released in the relatively near future. Elias Brinks has helped with the spectral-line chapter, which will be more up to date with less emphasis on HORUS and more on MX and WFCLN, and more attention for the IMLIN and UVLIN type of continuum subtraction. The VLBI chapter is a major rewrite to account for the advent of the VLBA. It is our hope to update the other chapters, add a chapter on single-dish data in *AIPS*, and even to add an index to the *CookBook*.