A I P S L E T T E R

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National Radio Astronomy Observatory

A newsletter for users of the
*A*stronomical *I*mage *P*rocessing *S*ystem

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Personal Notes

Ed Fomalont is on sabbatical leave for about six months at the Nobeyama Observatory in Japan. Eva spent the first few months with him there. Portions of his preliminary report on Fujitsu computers appear below in the Portability Column.

Pat Moore, formerly of Jodrell Bank, joined the staff of the VLA early last fall. He has assumed the job of *AIPS* system manager at the VLA. He is also involved in the planning for the new VLA/VLBA calibration package for *AIPS*, and will probably make significant contributions to the programming. He spent several days in Charlottesville during November, conferring on the plans for the project.

Nancy Wiener began 1985 with a new job title, *Technical Specialist,* and is now assigned to support the administrative functions of the *AIPS* project and to assist Gary Fickling in managing the VAX. In particular, Nancy will handle tape distribution, record-keeping, and all of the mechanics of handling the Gripes. She handled the master mailing list of the project for most of 1984. All of us are happy for her, and wish her well in her new rôle. A batch of more than 500 gripe responses were mailed in October with her considerable assistance.

Bob Burns, Bob Duquet, Arnold Rots, and Don Wells visited Digital Productions in Los Angeles on 22 October to examine their Cray X-MP installation and confer with them about use of it for synthesis mapping. (Al Moffet of CalTech was also present.) The facilities for graphics and digital scene production on movie film are most impressive and appear to be well suited for astronomical image processing.

Bob Burns, Ron Ekers, Gareth Hunt, and Don Wells attended a meeting in Washington on 18 December at NSF headquarters to discuss "Coordination of Advanced Scientific Computing at Centers for Astronomical Observation ..." Representatives of NOAO, NAIC, and STScI also attended. The needs and plans for supercomputers, communications, and data archiving were reviewed. All agreed that further coordination among centers is desirable.

Supercomputer News: *AIPS* under COS

NRAO's Computer Advisory Committee, which met at Green Bank in September, recommended that "NRAO [should] take early steps to get needed supercomputer experience." As a result of this recommendation, NRAO submitted a proposal to the NSF "Supercomputer Initiative" late in November. This proposal asked for an initial grant of 40 "hours" of time on the Cray X-MP at Vector Production, a Division of Digital Productions, in Los Angeles for the purpose of installing and testing an interactive *AIPS*. NRAO expects that less than 10 of these hours will be used for CPU time; the rest will be expended for overhead, mostly I/O charges. NRAO has not yet received the final, formal, written approval for the project from the NSF, but we expect it shortly. Bob Duquet has already begun to familiarize himself with the Vector Production system.

NRAO's objective will be to install as much of the 15JAN85 *AIPS* as is possible, and to make it operate interactively and to act as much like a supermini *AIPS* as we can. It is hoped that this installation can be accomplished in about four months, but experience suggests that a variety of problems will be encountered, some of which may cause delays.

Bob Duquet and Kerry Hilldrup will work full-time on the project, with the support of the rest of the *AIPS* programmers. Bob spent the week of 14–18 January in Charlottesville to confer on the details and he and Kerry have since begun preparing the Z routines for the COS operating system. A variety of changes have been made in the portable parts of *AIPS* during the last two months in anticipation of the needs of this project and we expect that more will be made. In general, these changes will be invisible to users.

It should be understood that this is a pilot project which is intended to permit NRAO to obtain experience with supercomputers. There is no implication that NRAO is only interested in machines manufactured by Cray Research; nor is there any implication that NRAO prefers COS over CTSS, an operating system used at many other Cray sites. In fact, the ambiance of the Vector Production site (*i.e.*, their image processing expertise and their interactive operating mode) is, on balance, more important to NRAO than is the specific CPU and OS which they possess. If the implementation of *AIPS* on the Cray proves successful, NRAO expects that its user community will be able to make use of this facility later in 1985 (supported by NSF supercomputer money) to perform a variety of synthesis mapping calculations which are nearly impossible with present *AIPS* machines.

A dedicated phone line from NRAO in Tucson to CalTech in Pasadena has been installed. Its purpose is to connect CalTech's VAXes into NRAO's internal DECnet network in support of the VLBA. NRAO has placed an order for another phone line from CalTech to Vector Production in Los Angeles. When this is in place the VAX-11/782 front-end computer at Vector Production will also join NRAO's network, permitting remote login and file transfer from either Virginia or New Mexico.

The *AIPS* programmers regard this project as having overriding priority. If necessary the *entire* team will be dedicated to it until its completion. *AIPS* users and site managers should understand that during the next few months we may not be as responsive as we usually are (in particular, UNIX-*AIPS* sites should note that Kerry is nominally committed full time to the supercomputer project). We trust that you will all bear with us, and that you will wish us well in this critical development.

Previews of Coming Attractions

During the last quarter, a certification and benchmarking package has been developed in Charlottesville. This package consists of a large RUN file coded in *POPS*, the *AIPS* command language. The file executes UVLOD to read a dataset of real VLA data. It then executes UVSRT, UVMAP, APCLN, ASCAL, MX, and VM. At each stage in which maps and beams are computed, the previously computed "standard" answers (which are read from tape with IMLOD) are compared against the newly computed values using COMB and IMSTAT. Small residuals prove that an *AIPS* implementation is correct; timing and I/O statistics can be printed by the accounting utility program for comparison with other *AIPS* implementations. This package is still undergoing tests in Charlottesville. Perhaps it will be ready for distribution by the 15APR85 release.

Certification of the FITS Tables Design!

We are delighted to report that, just before the end of this quarter, the task IMLOD was extended to support reading "naked" tables, ones not attached to an image. It does this by creating a dummy image and attaching the table to it. This enabled *AIPS* to read tapes containing three different test files generated by the *MIDAS* system at the European Southern Observatory in Garching, West Germany. One of the test files was the Uppsala galaxy catalog with about 13,000 entries. The tables were listed by the *AIPS* utility PRTAB and appeared to be correct. Last summer, a similar test tape generated by *AIPS* went to ESO and was read correctly by *MIDAS*. It should be noted that the tables reading and writing software in both *MIDAS* and *AIPS* was coded by programmers who did not participate in the design negotiations or in the preparation of the specifications document. In addition, the programmer in Germany and the programmer in the U. S. have never met and have not corresponded. Finally, the *AIPS* team can testify that its programmer (Gary) was not coached in any way by members of the design team (Eric and Don). Separation of the design and implementation functions at both sites suggests that the standards document is likely to be interpreted in a consistent way by programmers worldwide. Exchange of files between completely different software systems proves that the design truly does constitute a system-independent tables transport format. *We conclude that the proposed FITS tables extension standard is now certified as a feasible and satisfactory design.* The design team will probably submit the paper soon to *Astronomy and Astrophysics Supplements* for publication. Anyone who wants to make changes now had better move fast — *i.e.,* he should contact either Eric Greisen in Charlottesville or Preben Grosbøl in Garching *immediately.* The *AIPS* programmers expect that the tables data type will have a pervasive and profound influence on the evolution of *AIPS* from now on.

Abstracts of Selected Recent Memos

AIPS Memo No. 33: "Gridding Synthesis Data on Vector Machines", William D. Cotton and Donald C. Wells, January 1985. (See box on order form on last page of this *AIPSLETTER*.)

> An algorithm is described which is intended to grid aperture-synthesis visibility measurements efficiently on vector computers, especially on "long-vector" machines. The algorithm is parameterized to enable it to adapt to the properties of various CPUs and APs. The chief technical problem which is discussed is "vector dependency"; both the statistics of occurrence of dependency in real synthesis data and the technical options for coping with it in real vector machines (including Cray-1, Cyber 205, Convex C-1, Star ST-100, Masscomp AP-501, and Sky Warrior) are treated in detail.

The Portability Column

CPU/OS Combinations

UNIX/AIPS Kits: Kerry and Nancy are in the process of shipping out ten installation kits for 15JUL84 *AIPS* under UNIX. The kits include a set of "generic" Z routines that have been distilled from the experience of in-house implementations as well as that of our β-test sites. A small fraction (5–10%) of the Z routines remain system specific and are so noted in the installation guide. The orders being filled are for a wide variety of architectures and flavors of UNIX. We should soon know just how generic these routines are. A constant source of problems has been the use of the f77 I2 option (defaults integer variables and constants to 2-byte data items unless explicitly declared otherwise). A massive effort was made in the 15JAN85 release of *AIPS* to declare all undeclared items (at least in the "standard" code). To a large extent, this will eliminate the necessity of using the I2 option and thereby eliminate the associated problems. Kerry is in the process of porting the 15JAN85 release of *AIPS* to our IBM 4341 under UTS (Version 7 UNIX) and to our Masscomp MC-500 (System III UNIX). There will be no 15OCT84 release of UNIX/*AIPS*. Hereafter, all orders for UNIX implementations will be filled with the most recent *AIPS* release.

MASSCOMP MC-500/Sys.III: Kerry has made a number of test installations of 15JUL84 *AIPS* on the Greenbank machine in the process of checking the UNIX/*AIPS* distribution kit. The magnetic tape interface has been developed and tested. We are running version 2.1C of the operating system, but we still have version 2.1A of the Fortran compiler. This compiler has a few bugs in it that prevent us from declaring the installation a complete success. Most of these bugs are associated with the f77 I2 option.

Fujitsu Facom: Ed Fomalont informed us on 26 November that: "The Fujitsu people finally have *AIPS* working on the Facom computer here at Nobeyama. A month ago, when I first came, *AIPS* ran painfully slowly; however, its speed is now comparable with the VAX 11/780 with the array processor. The one major problem is that task shedding does not yet work. So AIPS is tied up while you make a map or do a large clean." ... "The Facom M200, now being used at Nobeyama, has a cycle time of 0.105 microsec or about 9.5 Mips or 3 Mflops. As an example of its speed, a 1024x1024 complex Fourier transform in the *AIPS* task UVMAP takes 70 sec in CPU time and corresponds to a compute power of about 1 Mflop. This system uses the pseudo array processor routines and I am not sure how efficient they are. This speed is nearly a factor of two faster than the VAX 11/780 with AP." ... "One of the astronomers here has contact with several people using the Fujitsu VP100 at Nagoya. They believe that it is 10 to 15 times faster than the M200 using software written for a conventional computer. Another factor of 3 to 5 is possible with some optimization of the code. Thus, 50 Mflops of usable computer power should be easily obtainable from the VP100; the VP200 should be twice as fast. These ratings are only about 20% of the advertised capacity of the machines and are probably realistic." Note: several Fujitsu models are marketed in the United States by Amdahl Corporation, 49.5% of which is owned by Fujitsu. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it.*

APs and other Vector Processing Hardware

Convex C-1: On 13 November two representatives of Convex Computer Corp. visited NRAO's Charlottesville offices to give a presentation on their new machine. This is a "mini-supercomputer" which was announced in October 1984. Its architecture is a blend of the best features of the Cyber 205 and the Cray-1. It has vector registers (like the Crays, but with length 128 instead of 64), constant-stride loading, gather/scatter, etc. and can do scalar operations while vector operations are in progress. Supported data types are byte, 16- and 32-bit integers, and 32- and 64-bit floating point in both VAX F and G formats. The architecture is not byte-swapped, *i.e.*, it is similar to the IBM and Modcomp rather than the VAX. It can chain and/or overlap its pipes (at up to 60 MFlop peak rates). The operating system is 4.2bsd UNIX, and the optimizing, vectorizing Fortran compiler accepts VMS-style Fortran, including most VMS extensions! The CPU–memory

and the I/O bandwidths are both 80 Mb/sec. Currently, gather/scatter and other "exotic" vector operators are not supported in a Fortran subroutine library, but it should be easy to do anything that is needed for synthesis mapping in assembly language. We conjecture that the C-1 can do any vector operation that the Cyber 205 can perform, but that it will have to execute several instructions to perform some of the single-instruction operations of the 205. Note that the *AIPS* **sed** script used for installation on UNIX systems could easily be augmented to expand all calls to the QV*xxxx* operators into inline DO loops which would then be optimized by the vectorizing compiler. This would eliminate the overhead from subroutine calls. In general, the C-1 appears to be *very* attractive as a potential host for *AIPS*. For further information contact: CONVEX Computer Corporation, 1819 Firman, Suite 151, Richardson, TX 75081, (214) 669-3700. The base price of the C-1 is about $500K. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it.*

About vector devices in general: See the review of *AIPS* Memo 33 ("Gridding Synthesis Data on Vector Machines") above. This memo will be of interest to anyone who wants to port *AIPS* to any new kind of vector hardware.

Image Displays

Comtal Vision One/20: We are embarrassed to admit that we did not have time to include the Y routines from Illinois in 15JAN85. We received recently a revised version of the Y routines (dated 8 January) from Andy Lubenow. Sites which need them before 15APR85 should contact us.

Printing and Plotting Devices

QMS Lasergrafix 1200 and 800: The Lasergrafix 800, mentioned in the previous issue of the *AIPSLETTER*, is now in full use in Charlottesville for printing, plotting, and typesetting. The original for this *AIPSLETTER* was produced on it. Task QMSPL has been developed and tested fully for the 15JAN85 release. It is in production use in Charlottesville and the users have applauded the resolution and cosmetic quality of plot output produced by the machine.

Summary of Changes: 15 October 1984 — 15 January 1985

These changes are listed in detail in the CHANGE.DOC file reproduced later in the *AIPSLETTER*. In the last *AIPSLETTER* we reported steps which left us poised to make a wide variety of internal modifications to the code. Instead of taking those steps this quarter, we chose to concentrate our efforts on proving and improving the transportability of *AIPS*. The UNIX version has been released in full and a considerable number of tar tapes of the 15JUL84 release will be mailed to UNIX sites. The code was moved to the Modcomp for the first time in a year and a record fraction of it was made to compile and link. As of this writing, the testing has been spotty, but encouraging. A new interface to a "virtual array processor" was defined and implemented for both FPS array processors (AP100 and 5000 series) and the pseudo array (host CPU) processor. The new interface is a lot cleaner and should simplify installations on other vector devices (*e.g.*, Crays). All three of these steps have caused us to correct and clean up the code in a wide variety of ways.

The quarter was not totally devoid of changes visible to the user. QWKPL is a new version of PRTPL which is, in some cases, significantly faster, but which requires large memory such as is available on VAXes. QMSPL interprets plot files for QMS Lasergrafix laser printers. It supports COPIES and "pen width" options and offers extensive support for grey scales including rescaling and good, high-speed output modes. RM was

completely revised and RMTST deleted. KONTR acquired better tick routines including map rotation, smaller increments, and smarter defaults and was made to do spectral-line mosaics. GRIPR and BATER were enhanced to have a true HELP facility and to handle the string adverbs used by such verbs as PRTMSG and GRIPE; they were also corrected to create message files when needed.

In the mapping area, tasks ASCAL, VSCAL, UVSUB, VBFIT, and MX were provided with adverbs to set the number of components in each field separately. The default beam classes in UVMAP and APCLN were changed to match those of MX and UVMAP was corrected to do the advertised 32x32 images. As a result of the super-computer project, the convergence criteria in VM were improved to speed up the task by as much as a factor of three. New adverbs to limit UVFLG to a range of visibility sequence numbers were added. The file creation routines were revised to require unique names without regard for physical type (*i.e.*, UV, MA). However, the simplifications which this will allow have not yet been propagated through the code.

As usual, there were also many miscellaneous corrections. Numerous minor matters in MX were fixed. A major bug in SLFIT was discovered by the Modcomp link editor. And a significant error in the precession was corrected in UVFIX. The handling of tables extensions by FITTP, IMLOD, and UVLOD was cleaned up considerably. PATGN was standardized, improving its speed, its handling of defaults, and its output image header. EXTLIST was corrected in its display of LEVS and its handling of bad plot files. The plotting programs were revised to center grey-scale pixels and the random-number initialization was made usefully fast.

CHANGE.DOC: 15Oct84–15Jan85

2150. *October 17, 1984* UVMAP *Bill*
Changed beam class to IBEAM, RBEAM, or LBEAM.
Moved nowhere.

2151. *October 17, 1984* APCLN *Bill*
Changed default IN2CLASS to IBEAM, RBEAM, or LBEAM. Also added a note to the history if the beam fit fails. Changed also DCLN.INC and CCLN.INC.
Moved nowhere.

2152. *October 18, 1984* MX *Bill*
Corrected misspelling of SUBBED in MXSUB, added the total number of components to each history file.
Moved nowhere.

2153. *October 18, 1984* RASHIFT.HLP *Bill*
Corrected typo, now says positive value causes larger X (rather than Y) value.
Moved nowhere.

2154. *October 18, 1984* UVSUB *Gary*
Moved to OLD, to Modcomp 6 December. Will be on VLA's 15OCT84 tape.

2155. *October 18, 1984* UVFLG *Bill*
Added adverbs BDROP, EDROP to specify a range of visibility sequence numbers in which flagging (or unflagging) is allowed. This option is also available in the flagging table. A message is now given when the flagging file is opened. Also changed UVFLG.HLP.
Moved nowhere.

2156. *October 22, 1984* UVMAP *Bill*

Modified to write dummy row in CONGRD to get around the blocking of rows in MDISK for images with a small number of rows. Will now do 32x32 on a VAX and should now work on machines with larger disk sector sizes.
Moved nowhere.

2157. *October 24, 1984* FITTP *Eric*

Changed the handling of clean components iterations to the INTEGER*4 value now in the headers. This was overlooked in the corrections done heretofore. Also changed DFTP.INC and EFTP.INC to declare an I*4 header array.
Moved to OLD this date, moved to VLA on Nov 7, moved to Modcomp on December 6.

2158. *October 24, 1984* MCREAT, UVCREA *Eric*

Revised the normal file creation routines to use the I*4 routine ZCREAT. Also revised them to ignore the file physical type in determining the default OUTSEQ and in requiring a unique name. This will allow us to drop INTYPE from most tasks — after a while. Created MAPSIZ, a true I*4 version of MAPSI3 which does not round up to "granules" since ZCREAT does not require that.
Moved nowhere.

2159. *October 25, 1984* MX *Bill*

Changed UMA1:[WDC] to INCS: in include statments.
Moved to OLD on Oct 25, VLA on Nov 7, Modcomp on Dec 6.

2160. *October 26, 1985* QMSPL *Eric*

Now that we have a QMS Lasergrafix 800 it is possible to test this task. Revised it to buffer the commands and to use more standard coding techniques. Created a new Z routine called ZQMSIO to open and write the print file. This required a new group logical symbol (on VAX VMS) called QMSQUE. Revised the Help file changing the name (from TKPL), dropping INTYPE, and adding COPIES. The Modcomp Z routine returns an error code and is otherwise null.
Moved nowhere.

2161. *October 30, 1984* DISKU *Eric*

Corrected a missing comma which caused the record numbers in calls to ZFIO to be I*2 rather than I*4.
Moved to OLD this date, moved to VLA Nov 7 and moved to Modcomp on Dec 6.

2162. *October 31, 1984* U15OCT84. *Gary*

The instructions for updating *AIPS* to the 15OCT84 release.
Moved to OLD, sent to VLA.

2163. *November 1, 1984* QWKPL, ZSBIT, ZQWKPR *Gary*

This is another version of PRTPL except that it has been simplified and optimized for a computer with large memory. There is no DOCENTER option (all plots are 1 page) and no complicated scheme to page the bitmap to disk (the bit map is kept in core). A big saving in CPU was made by inventing ZSBIT to set a single bit in a word, instead of the ZGTBIT/ZPTBIT combination. ZQWKPR is a version of ZDOPRT. QWKPL takes about the same time as PRTPL for simple plots, but can be 2 to 8 times faster for Grey scales or complicated plots. New Help file created.
Moved nowhere.

2164. *November 1, 1984* UVFND *Eric*
Corrected print to unit 1 (line printer) when DOCRT is true. Mysterious FOROO1.DAT files were appearing saying "... POINTS FOUND".
Moved to OLD and Modcomp this date, Moved to VLA Nov 7.

2165. *November 2, 1984* BCOMP, NCOMP *Bill*
Added new adverb arrays to allow specification of the first and the number of CLEAN components to process in up to 16 fields. Changed or added: POPSDAT.HLP, DAPL.INC, CAPL.INC, BCOMP.HLP, NCOMP.HLP.
Moved nowhere.

2166. *November 2, 1984* SETGDS *Bill*
Changed to allow specification of first and last components for each field independently.
Moved nowhere.

2167. *November 2, 1984* ASCAL *Bill*
Changed NITER to NCOMP to allow independent specification of the components to use in each field. Also changed: DCAL.INC, CCAL.INC, ASCAL.HLP.
Moved nowhere.

2168. *November 2, 1984* UVSUB *Bill*
Changed BITER and NITER to BCOMP and NCOMP to allow specifications for each field. Also changed: DSUB.INC, CSUB.INC, UVSUB.HLP
Moved nowhere.

2169. *November 2, 1984* VSCAL *Bill*
Changed NITER to NCOMP to allow independent specification of the components to use in each field. Also changed: DVCL.INC, CVCL.INC, VSCAL.HLP.
Moved nowhere.

2170. *November 2, 1984* VBFIT *Bill*
Changed NITER to NCOMP to allow independent specification of the components to use in each field. Also changed: DFRN.INC, CFRN.INC, VBFIT.HLP.
Moved nowhere.

2171. *November 2, 1984* Modcomp .E, .R *Eric*
Modcomp linkedit (.E) and task build (.R) files were revised to support the transport of 15OCT84 to the Modcomp. Revised in [.AIPS.ZPGM.MC4] were:

AIPS.E — Added AU3B to overlay.
AIPSB.E — Added AU3B and AU7A to overlay.
AIPSC.E — Added AU1 and CU8 to overlay.
BATER.E — Rearranged overlay to match code better.
BSTRT1.R — Changed LIST to LDIR.
DELSG.R — Changed LIST to LDIR.
EXPTAP.R — Changed LIST to LDIR.
GRIPR.E — Rearranged overlay to match code better.
POPSGN.R — Changed LIST to LDIR.

Created were:

CATCHT.E — New format conversion service program.
CATCHT.R — New format conversion service program.
ZPREP.R — Recreated missing TOC file for this Modcomp preprocessor program.

Moved to Modcomp this date (more or less), nowhere else.

2172. *November 2, 1984* MX *Bill*

Changed adverb BITER to BCOMP to allow the specification of the number of components in each field to use when restarting. Also changed: MX.HLP, DMX.INX, CMX.INC.
Moved nowhere.

2173. *November 5, 1984* GRDAT *Bill*

GRDAT was multiplying FLDSZ times OSFX, OSFY. This was causing UVSUB to fail for gridded interpolation mode.
Moved to VLA VAXes 21 November, Modcomp on Dec 6.

2174. *November 5, 1984* CHMATC *Pat*

CHMATC was returning incorrect results for single character search strings when the search did not begin at character number 1.
Moved nowhere.

2175. *November 5, 1984* MX *Bill*

Corrected error in message about channel number when starting with a channel number larger than 1.
Moved nowhere.

2176. *November 6, 1984* GRDAT *Bill*

Removed rescaling of SCLUG, SCLUG by OSFX, OSFY.
Moved nowhere.

2177. *November 7, 1984* Modcomp discovered *Eric*

Errors discovered by the Modcomp compiler and corrected were:

HIENH — Changed lower case comment to upper case.
BPINIT — (PSAP version) added message common includes since it uses NPOPS.
CCINI — Removed blank lines at end.
CTINI — Removed blank lines at end.
FRMT — Changed computation in ENCODE statememt.
GETHUT — Removed IMPLICIT NONE and standardized code.
TABINI — Changed lower case comment to upper case.
YTVCIN — Changed BIT16 to I*4 to allow it to be initialized as -32768.
ZCMPRS — (MC4) Fixed Fortran errors in statement labels.
ZFSIZE — (MC4) Removed blank lines at end.
ZMIO — (MC4) Removed excess (old) declaration of BLKNO.

Moved from the Modcomp this date, nowhere else.

2178. *November 7-8, 1984* GRIPR, BATER *Eric*

Revised GRIPR, DBCR.INC, and CBCR.INC to handle string adverbs and to perform the new operations available via the Gripe adverbs and verbs. Also added code to handle unary plus and minus and to do all of the options offered by PRTMSG and CLRMSG in AIPS itself. Revised the Help file. Then did the same to BATER and its Help file.
Moved to Modcomp 2 January, nowhere else.

2179. *November 9, 1984* Modcomp discovered *Eric*

The Modcomp compiler found errors in the non-standard subroutines:

`ALGSUB` — Changed subscript from 16 to 2 on variable dimensioned 2. May not have caused trouble because of excess coding.

`BOXBSM` — Added a comma to a `DATA` statement.

`COINC` — Removed subscripted `DO` loop limits. Changed `CATDIR` search opcode to avoid changing `COINC`'s inputs. Cleaned up the typing.

`GRDCRM` — Removed `INTEGER*4` arguments to `MINO` (in-line) function.

`PLVEC` — Removed blank line at beginning. Cleaned up typing. This routine truncates vectors off the plot: it should interpolate them, but that requires knowledge of the previous position.

`UVMSUB` — Removed blank line at end.

`VISDFT` — Removed `INTEGER*4` variables from `MAXO` and `MINO` functions.

Moved from Modcomp this date, nowhere else.

2180. *November 14, 1984* ISHORTINS.COM *Gary*

This procedure now sets `TVDIR` to a default value. Although the short procedure does not need `TVDIR`, `IPROMPTL` (used by both the short and long procedures) gets upset if it is not defined.

Will be on the `15OCT84` tape.

2181. *November 14, 1984* VM *Tim*

Changed code relating to convergence criterion. The old code had mistakes and conservative assumptions which slowed convergence by up to a factor of 3. The final image obtained should not be affected, only the speed with which it is calculated.

Also on VLA VAXes in `15OCT84` area, Modcomp on Dec 6.

2182. *November 14, 1984* UVSEN *Tim*

Now calculates minimum brightness temperature.

Also on VLA VAXes in `15OCT84` areas.

2183. *November 16, 1984* Modcomp discovered *Eric*

More bugs found debugging the stuff in `AIPPGM`:

`ZDCHIN` — (MC4) Called `ZFIO` with `I*2` record number.

`ZDOPRT` — (MC4) Called `ZMIO` with Pseudo `I*4` record numbers.

`ZFSIZE` — (MC4) Did not declare `ASIZE`, typo `CILUN` should be `CLUN`, did not `DATA` variable `N7`.

Moved from Modcomp this date, nowhere else.

2184. *November 19, 1984* Modcomp Discovered *Eric*

Corrected during Modcomp testing were:

`ZFI3` — (Modcomp) the disk sector was being incremented both by the I/O system and by `ZFI3`. Changed to save the initial sector and use that for the second read/write.

`ZFIO` — (Modcomp) same as `ZFI3`.

`ZMSGDK` — (Modcomp) same as `ZFI3`. Also added diagnostic messages to give info on I/O errors.

`EXFND` — Corrected 2 comments which referred to *RANCID*!

`EXIND` — Corrected 2 comments which referred to *RANCID*!

Moved from Modcomp this date, nowhere else.

2185. *November 19, 1984* MX *Bill*

Changed to sum components fluxes properly when restarting with old work file. Fixed bug which caused problems for Q or U maps. This problem was that the catalogue header for the uv work file did not set CAT4(K4CIC+JLOCS) to 1 and the subsequent routmes got confused about the Stokes type of the data.
Also on VLA VAXes in 15OCT84 area, Modcomp on Dec 6.

2186. *November 19, 1984* VISDFT *Bill*

Fixed bug which was causing an error in the calculations of the U polarization for true Stokes' polarization data.
Moved to VLA VAXes this date, Modcomp on Dec 6.

2187. *November 19, 1984* Modcomp .E, .R *Eric*

Modcomp linkedit (.E) and task build (.R) files were revised to support the transport of 15OCT84 to the Modcomp. Revised for APLPGM were:

BLANK.R — Changed to identify interactive terminal, make BLANK2 complex duplicate.
BLSUM.E — New: simple overlay from main program.
BLSUM.R — New: like BLANK, but no batch versions.
CNVRT.E — Revised for new program structure.
COMB.E — Added DIE to the overlay tree.
EXFND.E — Added an overlay structure.
FITTP.E — Corrected spelling of one routine name, added new table routines to overlay.
GREYS.E — Corrected overlay structure.
IMLOD.E — Corrected overlay structure to new routines.
NOBAT.E — New: simple edit instruction.
NOBAT.R — New: simple task build instructions.
PROFL.R — Changed LIST to LDIR.
PRTAB.E — New: straightforward overlay tree.
PRTAB.R — New: interactive terminal means PRTAB2 is complex duplicate.
PRTCC.E — Revised for new subroutines in an overlay and moved to APL area.
PRTCC.R — Moved to APL area.
PRTIM.R — Changed to support CRT terminals with complex duplicate.
PRTUV.R — Changed to support CRT terminals with complex duplicate.
QMSPL.E — New: simple edit instruction (in APL area).
QMSPL.R — New: simple task build instructions (in APL area).
SL2PL.E — Added an overlay structure.
TAFFY.E — Changed TAFHIS to OUTMA in overlay structure.
TRANS.E — Added DIE to the overlay.
UVFND.R — Added CRT to devices, UVFND2 becomes complex duplicate.
XBASL.E — New: created overlay tree.
XBASL.R — New: basic interactive task build structure (with CRTs).
XGAUS.E — Revised to make it follow Modcomp's rules better.
XMOM.R — Removed unnecessary assignment of a terminal.
XSMTH.E — Changed subroutine name in overlay.
XSUM.E — Changed subroutine name in overlay.

Moved to Modcomp this date, nowhere else.

2188. *November 21, 1984* UVMDIV *Bill*

Added a message to the user when division requires model computation by summing and there will later be a message about model subtraction.
Moved VLA VAXes this date, Modcomp on Dec 6.

2189. *November 21, 1984* MODCOMP *Bill*

Added or modified the following:

ASCAL.E	MX.E	UVSUB.E	VSCAL.E	VBFIT.E
ASCOR.E	CONVL.E	FFT.E	VM.E	GRIDR.E
GRIDR.R	SELSD.E	SELSD.R	PRTSD.E	PRTSD.R

Moved to Modcomp Dec 10 (Eric).

2190. *November 21, 1984* Ancient FFT routines *Bill*

A number of old and currently disused (except in the bowels of APMAP and it has its own copy) FFT routines are not being upgraded to use the new AP interface; these routines have comments added to this effect. The affected routines are: FILL1, FILL2, XPOSE, EMPTY1, EMPTY2. Deleted UVHIST.
Moved nowhere.

2191. *November 24, 1984* QMSPL *Eric*

Revised QMSPL to fill the 80-character buffer fully and to use built-in font number 204 rather than the plotter font. Revised ZQMSIO (VAX) to do A-format character-string I/O which is much more efficient than any other VAX formatted I/O (unformatted produces a file unacceptable to the QMS). Changed GREYS to center the pixels and PRTPL to plot them in the correct place.
Moved nowhere.

2192. *November 26, 1984* Modcomp Discovered *Eric*

Corrected during Modcomp testing were:

- CORFQ.E — Added an overlay structure, things have grown.
- ZM7OMC — (MC4) Changed call sequence to match the VAX even though the Modcomp does not need the UFT to be passed.
- CHKTAB — Changed illegal call to MIN to correct MINO, fixed up typing, corrected N6 to N8 in the test on format types. Moved to NOTSUB.
- DCODEF — Changed illegal call to MAX to correct MAXO, fixed up typing some. Why is this routine needed rather than the standard parsing routines: moved it to NOTSUB!
- TVOPEN — Corrected call sequence of YTVMC (no arguments).
- ZQMSIO — Error in the error message was corrected.
- FITTP — In subroutine MAXFN2, N1 was not declared nor DATAed, but it was used.
- PRTAB — Removed blank line at end.
- PRTTP — Extension subroutine was setting GCOUNT when PCOUNT was supposed to be set. Fixed the spelling.

Moved from Modcomp this date, nowhere else.

2193. *November 26, 1984* QMSPL *Eric*

Added a pen width adverb LPEN. Changed QMSPL, QMSPL.HLP, DAPL.INC, CAPL.INC, and POPSDAT.HLP, and created LPEN.HLP.
Moved nowhere.

2194. *November 26, 1984* SLFIT *Eric*

An error in the declarations in subroutine GFUNC led to the main common being misaligned in that one crucial routine. This error was discovered by the Modcomp.
Moved nowhere, should go to VLA, OLD etc.

2195. *November 27, 1984* New AP interface *Bill*

The interface to the array processor has been changed. There is now a set of "Q" routines for the array processor functions. The list of Q routines for the FPS array processor is as follows:

Q1FIN	Q1GRD	QBAKSU	QBOXSU	QCFFT
QCLNSU	QCRVMU	QCSQTR	QCVCMU	QCVCON
QCVEXP	QCVJAD	QCVMAG	QCVMMA	QCVMOV
QCVMUL	QCVSDI	QCVSMS	QDIRAD	QFINGR
QGET	QGRD1	QGRD2	QGRD3	QGRD4
QGRDCC	QGRDFI	QGRDMI	QGRID	QGRIDA
QGSP	QHIST	QINIT	QINT	QINTP
QLVGT	QMAKMS	QMAXMI	QMAXV	QMCALC
QMINV	QMTRAN	QMULCL	QPHSRO	QPOLAR
QPTDIV	QPTSUB	QPUT	QRECT	QRFFT
QRFT	QRLSE	QSEARC	QSVE	QSVESQ
QUVIN	QUVINT	QVABS	QVADD	QVCLIP
QVCLR	QVCOS	QVDIV	QVEXP	QVFILL
QVFIX	QVFLT	QVIDIV	QVLN	QVMA
QVMOV	QVMUL	QVNEG	QVRVRS	QVSADD
QVSIN	QVSMA	QVSMAF	QVSMSA	QVSMUL
QVSQ	QVSQRT	QVSUB	QVSWAP	QVTRAN
QVTSMU	QWAIT	QWD	QWR	QXXPTS

Moved nowhere.

2196. *November 27, 1984* New AP interface *Bill*

The interface to the array processor has been changed. There is now a set of "Q" routines for the array processor functions. The list of Q routines for the pseudo array processor is as follows:

Q1FIN	Q1GRD	QBAKSU	QBOXSU	QCFFT
QCLNSU	QCRVMU	QCSQTR	QCVCMU	QCVCON
QCVEXP	QCVJAD	QCVMAG	QCVMMA	QCVMOV
QCVMUL	QCVSDI	QCVSMS	QDIRAD	QFINGR
QGET	QGET2	QGRD1	QGRD2	QGRD3
QGRD4	QGRDCC	QGRDFI	QGRDMI	QGRID
QGRIDA	QGSP	QHIST	QINIT	QINT
QINTP	QLVGT	QMAKMS	QMAXMI	QMAXV
QMCALC	QMINV	QMTRAN	QMULCL	QPHSRO
QPOLAR	QPTDIV	QPTFAZ	QPTSUB	QPUT
QPUT2	QRECT	QRFFT	QRFT	QRLSE
QSEARC	QSVE	QSVESQ	QUVIN	QUVINT
QVABS	QVADD	QVCLIP	QVCLR	QVCOS
QVDIV	QVEXP	QVFILL	QVFIX	QVFLT
QVIDIV	QVLN	QVMA	QVMOV	QVMUL
QVNEG	QVRVRS	QVSADD	QVSIN	QVSMA
QVSMAF	QVSMSA	QVSMUL	QVSQ	QVSQRT
QVSUB	QVSWAP	QVTRAN	QVTSMU	QWAIT
QWD	QWR	QXFOUR	QXXPTS	

And QXFOUR.MAR, the rest being Fortran.

Moved nowhere.

2197. *November 27, 1984* INCS:ZVND.INC *Bill*

Added a "Z" include to allow compiler directives enabling vectorizing pseudo-AP code in spite of the apparent dependencies. The VAX version is of course useless but is harmless.
Moved nowhere.

2198. *November 28, 1984* More on new AP interface *Bill*

The subroutines which use the AP were all converted to the new AP interface. Those which had pseudo I*4 input arguments have been renamed in the old version for use during the general upgrade. The tasks which use these renamed subroutines have been modified (except for MX which is currently being upgraded). Utility subroutines modified (new name for old version) were:

APXPOS (APXPO3)	APIO (API3)	GRDSUB	GRDCRM	PASS1
CONVFN (CONVF3)	INTPFN	VISDFT	APROLL	PASS2
GRDTAB (GRDTA3)	QROLL (BPROLL)	CCSGRD	ALGSUB	

Tasks:

APMAP	UVMAP	GRIDR	REGLR	UVDIS

Also during the upgrade GRDTAB was modified so that it now gives a symmetric gridding correction function.
Moved nowhere.

2199. *November 28, 1984* FUDGE *L. Molnar/Bill*

Declared IRET in main and DIDDLE, corrected format statments 1000 and 1010 in SENDUV.
Moved nowhere.

2200. *November 28, 1984* CLD *L. Molnar/Bill*

This precession routine contained an error which causes a nearly 400 year error in the epoch. Previous results obtained with UVFIX are suspect.
Moved nowhere.

2201. *November 29, 1984* GRTOTEX *Don*

Corrected an error in the order of the CLOSE statement and the file initialize operation which allowed the input file to be initialized (deleted) *before* the buffer flush on the output. This logic caused portions of two gripes to be lost when the network crashed between the initialize and the CLOSE. Also made minor mods to the output file format.
Moved to VLA VAXes.

2202. *November 29, 1984* ALGSUB *Bill*

Removed an extraneous statement which was giving I*2 overflows on 2048 or larger maps.
Moved to VLA VAXes, Modcomp on Dec 6.

2203. *November 29, 1984* GINITL, GINITG *Eric*

Changed the form of rounding of the corners. Now BLC is rounded up, TRC is rounded down. This results in the "extra" portions being negative on the left and bottom and positive on the top and right. PRTPL and TKPL seem to assume this and it will work much better with GREYS (where it now matters). GINITG needed change also to send the correct number of pixels.
Moved nowhere.

2204. *November 29, 1984* RANDIN *Eric*

Changed the random number initialization routine to work from a table rather than beginning from scratch each time. The table was determined by running from scratch about 700,000 times. RANDIN now just diddles its starting point using the current time. The "from scratch" code was left in the routine as comments.
Moved nowhere.

2205. *November 29, 1984* FITTP, IMLOD *Gary*

These programs did not work properly for clean components in the old tables format. FITTP would crash while trying to write the old format (DONEWTAB = FALSE). IMLOD would read old tapes, but would write the CC files to disk in the old CC file format. I also changed the names of a number of subroutines in IMLOD that IMLOD used to share with UVLOD but are now internal to IMLOD and work for the new table format.
Moved to OLD, VLA, to Modcomp on Dec 6, will be on 15OCT84 tape.

2206. *November 30, 1984* Modcomp driven *Eric*

More changes/bugs resulting from code on Modcomp:

ZM70OP	—	Added declaration of variable TAPE — else couldn't assign the TV.
APCLN.E	—	Broke into more sub-overlays under FILES, GRIDER, RESTOR, and APDFFT.
XGAUS.E	—	Broke into more overlays under XGAUDO.
XBASL.E	—	Broke into more overlays under XBASDO and DO1BAS.
DPLY.INC	—	Dropped dimensions from 850 to 512 and 8 to 5.
XBASL	—	Dropped the extremes from the program: can do 512-point baselines (instead of 850) and 4^{th}-order (instead of 7^{th}-order) polynomials.
XBASL.HLP	—	Changed to reflect the above limits.
UVFND	—	Fixed lower case comment.
APCLN	—	An INTEGER*4 was a MINO argument.

Moved nowhere.

2207. *November 30, 1984* PRTPL *Eric*

Changed the method of scaling some as a result of the tests made on QMSPL. The error only mattered on GREYS plots with a very few pixels on each side.
Moved nowhere.

2208. *December 3, 1984* TVOPEN *Bill*

Fixed bug, there was no normal return, it always ended up thinking the TV wasn't assigned.
Moved nowhere (but the old version would never work properly).

2209. *December 3, 1984* MCUBE *Pat*

Fixed bug in MCUBE. Images were not always copied to the correct plane.
Moved nowhere.

2210. *December 4, 1984* AP interface update *Bill*

Upgraded several tasks to new AP interface and fixed several minor bugs and coding standard violations. Affected are:

MX	DMX.INC	CMX.INC	ASCAL
APCLN	DCLN.INC	CCLN.INC	VM
UVMAP	DMPX.INC	CMPX.INC	

Moved nowhere.

2211. *December 4, 1984* APCLN *Bill*

Removed IROUND calls when interpreting number of components.
Moved nowhere.

2212. *December 4, 1984* UVDOUT *Bill*

Stopped taking exclusive use of the output file; this was causing problems when the input file was the output file.
Moved nowhere.

2213. *December 4, 1984* ASCAL *Bill*

Initialized FACGRD in SCLMOD before call to UVMDIV. This bug caused the model values in multi-pass model computation to be 0.0.
Moved nowhere.

2214. *December 5, 1984* ALGSUB *Bill*

Corrected "Z" shift term being sent to QUVINT. This bug was causing errors in long shifts resulting in models being subtracted from the wrong place.
Moved VLA VAXes this date and [AIPS.MOVOLD], Modcomp on Dec 6.

2215. *December 5, 1984* More AP interface updates *Bill*

This is the last of the AP tasks to be upgraded to the new interface: CONVL, FFT, GRIDR. Also the code in GRIDR was cleaned up a bit.
Moved nowhere.

2216. *December 5, 1984* Installation Procedure Routines *Gary*

These were modified to transport and give the option to install the 5000 series FPS AP subroutines.

TRANSPRT.COM	IBUILD.COM	ICOMPAP.COM	MV2C1004.
ICREATE.COM	ILOAD.COM	ISHORTINS.COM	MV2C1008.

Will be on 15OCT84 tape.

2217. *December 5, 1984* Help UVLOD *Pat*

UVLOD.HLP was updated to make the help information clearer.
Moved to VLA, nowhere else.

2218. *December 6, 1984* GRIPR *Pat*

Bug fixed in GRIPR. It was failing to create a message file if one did not already exist. This caused the EXIT command to fail.
Moved to VLA, to Modcomp 2 January.

2219. *December 7, 1984* MX *Bill*

Declared loop counter in MXCSUM to be I*4 to avoid I*2 overflow.
Moved nowhere.

2220. *December 7, 1984* RASHIFT.HLP *Bill*

Now says moves to "smaller X-pixel value".
Moved nowhere.

2221. *December 10, 1984* Modcomp discovered *Eric*

More Modcomp discovered:

FITTP — Referred to BUFF4(3) when it had been declared *locally* as (1). Changed the declaration since it was equivalenced. Removed reference to DUV3.INC.

ASCOR — Used 7-letter variable names — changed WEIGHT1 and WEIGHT2 to WAIT1 and WAIT2. Changed R0, R1 to F0, F1, since the latter were declared and DATAed. This was an error causing gains of zero to be applied to data sometimes on VAXes.

Moved from the Modcomp this date.

2222. *December 10, 1984* GRIDR *Bill*

Removed bug introduced in AP interface update, dimensioned NREC(2) in SDGGRD.
Moved nowhere.

2223. *December 10, 1984* DOCTXT:GOINAIPS.INC *Bill*

Changed the page length to 58 lines for the laser printer.
Moved nowhere.

2224. *December 10, 1984* KONTR *Arnold*

Fixed bugs introduced at last update. Fixed problems arising around saddle points under obscure conditions. Fixed problems with quantized data. Added better auto-scaling of tick marks for small plots with SCALR1=0 default. Allow tick mark intervals down to 0.01s and 0.1". Also changed KONTR.HLP and PCNTREQ.INC.
Moved to VLA VAXes, nowhere else.

2225. *December 11, 1984* IMLOD *Gary*

Cleaned up several Modcomp discovered nonstandard features. Also, fixed a bug introduced in the 15JUL84 version, which caused the program to fail to read 32 bit integer tapes.
Moved to OLD, VLA, nowhere else.

2226. *December 12, 1984* QMSPL *Eric*

Introduced major changes to allow the program to interpret grey scales. The random dots pattern of PRTPL is available, but at similar cost. Quicker random patterns may be obtained by downloading random fonts. However, the best results come from a printing screen approach suggested to us by some folks from Starlink. This may be done slowly (and most correctly) or very much faster and plenty good enough. All these choices are under control of OPCODE. Also, the grey levels may be clipped and rescaled and a transfer function applied. Added a lot to the Help file also.
Moved nowhere.

2227. *December 13, 1984* PRTACC *Gary*

Fixed error in format statement 1350 for variable IOCNT. Changed F13.3 to I10 and cleaned up a few assignment statements left over from when IOCNT was a floating point, rather than an I*4.
Moved nowhere.

2228. *December 14, 1984* QMSPL *Eric*

Corrected a few bugs having to do with large images. Added an option to scale and reclip the grey levels after application of the transfer function. This will allow the user to set large areas of black to a deep grey which is visually more pleasing and easier on the hardware. Changed adverbs around and fixed the Help file.
Moved nowhere.

2229. *December 14, 1984* DIRDEC *Eric*

Found an error which crept in when the last change was made (for 15OCT84). In the ARC geometry, it is now DARCOS (DA) rather than DARCOS (DA/DC) — the divide had already been done. Three lines earlier, DB is now DA/DSIN(DA) rather than the inverse. That typo has been there a while.
Moved nowhere.

2230. *December 14, 1984* DeAnza TV routines *Eric*

Created dummy routines YALUCT, YFDBCK, and YRHIST so that some tasks can link. However, since the DeAnza does not have a feedback ALU nor a real-time histogram subunit (that I know about, anyway), these routines are just stubs which return error code 2. Similarly, I also made a stubbed version of YGYHDR. That routine assumes that I/O is simply done via a pure header and a call to write. Such is not the case for DeAnza.
Moved nowhere.

2231. *December 17, 1984* ARESTORE ABACKUP *Gary*

Fixed some badly designed parts. Both routines now ask for the tape drive number and check for a mounted tape, rather than depending on logical name TAPE. ABACKUP now does a BACKUP/DELETE when the user asks for it, rather than having a separate delete step.
Moved nowhere.

2232. *December 18, 1984* CONVFN.FOR *Colin Lonsdale/Kerry*

Several cases of calculated array indices used expressions that produced real results. Temporary I*2 variables have been assigned the results of these expressions and used as the array indices instead. This cleared up the problem of convolution type 5 in programs that call this routine (*e.g.*, UVMAP, MX) for UNIX *AIPS* installations and probably others.
Moved nowhere.

2233. *December 18, 1984* Bugs *Eric/Kesteven*

Corrected two software bugs reported in detail by M. Kesteven:

AU5D — Changed code restricting the number of planes displayed by TVMOVIE to be centered correctly in range requested.

YLUT — (DeAnza version): changed to set only the soft registers referenced in CHANNL — all were being set.

AU5A — Increased the buffer size to allow 4096 floating images.

Moved nowhere.

2234. *December 18, 1984* Help files *Eric*

Changed:

ROMODE — To reflect the name change for TV adverbs TBLC, TTRC, TXINC, and TYINC.

TVROAM — To refer to ROMODE Help file where appropriate.

INPUTS — To give the message level used.

Moved nowhere.

2235. *December 18, 1984* NEWPOS *Eric/Kesteven*
The NCP geometry is also used in the southern hemisphere! Changed NEWPOS to check the sign of the declination and return the correct one for this geometry.
Moved nowhere.

2236. *December 18, 1984* EXTLIST *Eric*
In AU8A, corrected bugs put in when going to 30 LEVS — namely increased the loops to 30 and upped the addresses of some of the adverbs in PCNTR (the ones which follow LEVS). Also changed it to use a more flexible format on the LEVS. Corrected I/O error handling to go on to the next plot file on error and to close the currently open file. Changed the addresses for GREYS plots because the INTYPE adverbs were dropped. Added lots of tests for bad values to try to prevent AIPS from blowing up. (Note that this will not work correctly on old GREYS files.)
Moved nowhere.

2237. *December 18, 1984* GREYS *Eric*
Changed to set DOCONT to false when the second image name is all null. This affects only EXTLIST — no contours were drawn in any case. Changed GREYS.HLP, DGRY.INC, CGRY.INC and GREYS to drop INTYPE and IN2TYPE as input adverbs. Improved the testing for the 2 images being the same in order to avoid 2 identical name strings at the top of the plot.
Moved nowhere.

2238. *December 19, 1984* QMSPL *Eric*
Corrected a bad branch address which caused aborts when OPCODE = 'NONE'.
Moved nowhere.

2239. *December 19, 1984* RENAME *Eric*
Changed AU7 to take the correct error branch on duplicate name. Before it was renaming the file in the header and on the terminal, but not in the catalog.
Moved nowhere.

2240. *December 19, 1984* Help FITTP *Eric*
Modified the wording describing DOTWO to clarify its meaning.
Moved nowhere.

2241. *December 19, 1984* IMLOD *Gary*
Made additional fix for reading 32-bit FITS tapes — the max and min were coming out wrong in the header.
Moved nowhere.

2242. *December 20, 1984* MX *Pat*
Improved Help file to clarify what happens with OUTSEQ=0.
Moved to VLA, nowhere else.

2243. *December 21, 1984* MX *Bill*
Fixed bug in the algorithm converting residual histogram cell number to a minimum flux level to be loaded into the AP. The problem was causing too few residual points to be loaded.
Moved to VLA this date (Changes only — not source code).

2244. *December 21, 1984* ASCAL *Pat*

Bug fixed in subroutine SOLVE. An integer overflow was sometimes occurring.
Moved to VLA, nowhere else.

2245. *December 21, 1984* GRIPR, BATER *Eric*

Added Pat's correction — creating a message file, if needed — to BATER. In both, changed the name of the current HELP facility to INPUTS and added a real HELP facility. Changed GRIPR.HLP and BATER.HLP to match this change.
Moved to Modcomp 2 January, nowhere else.

2246. *December 27, 1984* Modcomp *Eric*

More fixes prompted by the Modcomp:

GEOM — Changed all FUNCTION subroutines to ordinary ones. The VAX and Modcomp disagree on how to declare I*2 FUNCTIONs.

PGEOM — As GEOM.

LGEOM — Same as GEOM, except that there were 3 FUNCTIONs instead of 2.

PATGN — Was okay on Modcomp, but fixed it up some. Changed typing. Moved default setting out of inner loop. Made it check and default parameters more forgivingly. Removed TAB characters.

PATGN.HLP — Changed wording and typing — documented defaults.

VBFIT — Tested on IRET when BPROLL set IERR. Fixed that.

VSCAL — Used REAL*4 functions (SQRT, CMPLX) on REAL*8 arguments in GCALC1, declared DO to be REAL*4 but used it as real*8 in NCALC and, hence, in an argument to the function evaluator.

NINER — Corrected typing, removing TAB characters and putting the text back in the first 72 columns(!), removed character-string constants from code, changed DATA of REAL*4 variable to have REAL*4 constants.

MWFLT — Began cleaning this one up: removed unused common which was declared out of order, fixed DO loop limit which was a computation, cleaned up typing some. This will need work and cannot fit on the Modcomp.

Moved to Modcomp this date, nowhere else.

2247. *December 27, 1984* Modcomp .E, .R *Eric*

Revised link edit and task build files for NOTST programs:

PBCOR.E — Added more overlay segments.

GEOM.E — Made into TWOMAP.

VSCAL.E — Corrected several errors: referred to ASCAL, had SOLVE listed twice at level 1, used wrong levels.

Moved to Modcomp this date, nowhere else.

2248. *December 27, 1984* New Modcomp .E, .R *Eric*

Created new link edit and task build files for NOTST programs:

LGEOM.E	PGEOM.E	PATGN.E	NINER.E	MWFLT.E
LGEOM.R	PGEOM.R	PATGN.R	NINER.R	MWFLT.R
FILLR.E	FILLR.R			

Moved to Modcomp this date, nowhere else.

2249. *December 27, 1984* Modcomp .E *Eric*

Changed the following link edit files in NOTST to TWOMAP:

GEOM	DBCON	IMFIT	RM	RMTST	APGS
ASCAL	BSCAL	UVSUB	VBFIT	VSCAL	

Moved from Modcomp this date, nowhere else.

2250. *December 27, 1984* POPS *Eric*

A logic error in EQUIV was discovered. With scalar strings, it was returning a syntax error when the strings were of unequal length after trailing blanks were discarded. Changed it to return a not-equivalent code instead.
Moved nowhere.

2251. *December 28, 1984* Modcomp *Eric*

More fixes prompted by the Modcomp:

- DCONV — Fixed errors: computation in output list, R*-3 changed to -R*3, statements out of order, blank lines at end. Did a lot of correcting of the typing style. This is a long, linear program — not well structured, but straightforward.
- IMMOD — Removed references to VAX functions SIND, COSD, and RAN, replacing them with SIN, COS, and our random number generator. Changed the function NOISE to a subroutine. Fixed up typing some.
- IRING — Corrected declaration ordering and fixed up typing some. Replaced character constants in the code with DATAed holerith variables.
- PFPL1 — One cannot use DATA statements to initialize variables which are in common. Made local variables to do the initialize and then copy to the common ones.
- PFPL2 — As PFPL1.
- PFPL3 — As PFPL1.
- PLROW — Variable in common was DATAed — changed to set it in code.
- NINER — Subroutine names too long — limit is 6 characters! Changed a bunch.
- PGEOM — Changed ASIN to ARSIN, our name for that function.
- PLCUB — Fixed declaration order, declared and DATAed MAGIC, worked on typing some. Will not overlay well.

Moved to Modcomp this date, nowhere else.

2252. *December 28, 1984* New Modcomp .E, .R *Eric*

Created new link edit and task build files for NOTST programs:

DCONV.E	DCONV.R	IRING.E	IRING.R	PFPL1.E
PFPL1.R	PFPL2.E	PFPL2.R	PFPL3.E	PFPL3.R
PLROW.E	PLROW.R	PLCUB.E	PLCUB.R	

Moved to Modcomp this date, nowhere else.

2253. *December 28, 1984* JAFPL *Eric*

Moved this task to LOCAL — it wants to use the TV camera on the measuring engine to make digitized pictures. It probably has not been revised for all the changes made to the TV routines a while back.
Moved nowhere — and it shouldn't be.

2254. *December 31, 1984* UVPGET, DUVH.INC, CUVH.INC *Bill*

Added the SOURCE random parameter (ILOCSU) to search list and includes DUVH.INC and CUVH.INC. UVPGET does not check that a SOURCE random parameter was actually found.
Moved nowhere.

2255. *December 31, 1984* Modcomp *Eric*

More fixes prompted by the Modcomp:

UVLOD — Subroutine FITRXU: changed DATA of common variable, revised typing, removed error in which unknown extension caused writing to history file.

DCONV — Fixed missing declare and DATA for MAGIC, lower case comment, and use of MAX and MIN rather than (the correct) AMAX1 and AMIN1.

Moved to Modcomp this date, nowhere else.

2256. *December 31, 1984* New Modcomp .E, .R *Eric*

Created new link edit and task build files for NOTST programs:

VSCAL.R UVSEN.E UVSEN.R

Moved to Modcomp this date, nowhere else.

2257. *December 31, 1984* Modcomp .E, .R *Eric*

Revised link edit and task build files for NOTST programs:

VSCAL.E — Referred to ASCAL, not VSCAL.

UVLOD.E — Added new table extension to overlay, move to NOTST.

UVLOD.R — Moved to NOTST.

Moved to Modcomp this date, nowhere else.

2258. *December 31, 1984* ZACTV8 *Eric*

Changed the Modcomp version to support 3 load module libraries in sequence. The NOTST one was running out of room.

Moved to Modcomp this date, nowhere else.

2259. *January 2, 1985* Modcomp *Eric*

More fixes prompted by the Modcomp:

IMMOD — Common INPARM not declared correctly at all in subroutine IMMOMA — should not affect VAX usage.

IRING — Changed MIN and MAX to correct AMIN1 and AMAX1.

PFPL3 — Statements out of order in PLINIT (a DATA preceded an EQUIVALENCE). Fixed dimension of PIXRNG in START also.

PLCUB — Changed MIN and MAX to AMIN1, AMAX1, MINO, and MAXO as needed to be correct.

Moved to Modcomp this date, nowhere else.

2260. *January 2, 1985* Modcomp .E, .R *Eric*

Revised link edit and task build files for NOTST programs to refer to the second PL file (called PL2):

APGS	APMAP	ASCAL	BSCAL	CONVL	FFT
GRIDR	MX	NTERP	REGLR	UVDIS	UVMAP
UVSUB	VBFIT	VM	VSCAL		

Moved to Modcomp this date, nowhere else.

2261. *January 2, 1985* DFLOAT *Eric*

This Modcomp assembly language routine needed fixing so that it could run in TWOMAP tasks. Added CTR 2 and CTR 3 references and changed registers to use in the subroutine interface.

Moved to the Modcomp this date, nowhere else.

2262. *January 3, 1985* VSCAL *Bill*
Upgraded to new AP interface.
Moved nowhere.

2263. *January 3, 1985* LGEOM *Don*
An integer overflow could occur when the input image or window was less than about 22 pixels wide. Fixed by defining an I*4 temporary variable.
Moved nowhere.

2264. *January 4, 1985* UVPGET, DUVH.INC, CUVH.INC *Bill*
Added IF to the regular axis list; UVPGET does not give an error if this axis is not found but its pointer (JLOCIF) is set to -1. Also added INCIF, the IF axis increment.
Moved nowhere.

2265. *January 4, 1985* KONTR, PCNTREQ.INC *Arnold*
Added spectral line mosaic capability. Added proper annotation for rotated maps. Added pixel coordinate annotation; will now contour any map. Also changed the Help file.
Moved to AIPS::, VAX3::, TUCVAX::.

2266. *January 7, 1985* VBCIT, VBCIT.HLP *John*
Modifications supplied by Larry Molnar have been added to VBCIT. The user may now indicate in the stations list text file, IN2FILE, the type of antenna mount ('ALTAZ' or 'EQUAT') at each telescope. This information is carried in the antennas extension file.
Moved nowhere.

2267. *January 7, 1985* CORMS *Pat*
Fixed bug causing divide by zero when two noises were equal.
Moved VLA, nowhere else.

2268. *January 7, 1985* CHKTAB, UVLOD *Gary*
Several bugs in loading new antenna files. CHKTAB was not decoding the format codes correctly. Also, subroutine ANTAB, of UVLOD needed TABHDR changed to TBHDR and rearrangement of the order of variables in the common.
Moved to OLD, VLA, to Modcomp 10 January, nowhere else.

2269. *January 8, 1985* RM, RMTST *Rick/Pat*
Task RM updated so that it should now work properly. Help file also improved. RM now replaces the development version of this program called RMTST which has been deleted.
Moved to VLA, to Modcomp 10 January, nowhere else.

2270. *January 10, 1985* New Modcomp .E, .R *Eric*
Created new link edit and task build files for NOTST programs:
APVC.E APVC.R STEER.E STEER.R
Moved to Modcomp this date, nowhere else.

2271. *January 10, 1985* Modcomp *Eric*

More fixes prompted by the Modcomp:

UVDIS — In TVDISP, used subscript IJ when intended J. Fix (not full code) to Modcomp.

DVC.INC — Blank line removed.

APVC — Minor typing fixes made, including changing some variable names which were too long.

STEER — Fixed up typing some.

GRIDR — Added DHDR and CHDR includes to DPARM — this and several other fixes were moved to Modcomp, not the code itself since it has been revised too much.

PRTSD — IDECS misspelled as ISECS — made format error.

PRTSD.E — Added references to libraries which are required.

VBCAL.R — Added creation of batch versions.

Moved to Modcomp this date, nowhere else.

2272. *January 11, 1985* Modcomp *Eric*

More fixes prompted by the Modcomp:

CSC.INC — Removed blank lines at top and bottom of file.

VBANT — Made a lot of typing changes — there are a lot to go.

UVAVG — Replaced computations in DO loop ranges with temporaries. Also messed with the typing a good bit.

UVFIL — Changed K2SEQ to correct K2IMS, some typing changed.

UVMOD — Changed to call our random number generator rather than the VAX's. Corrected calls to SIN and COS, changed all FUNCTION subroutines to normal ones, retyped a bunch.

UVMOD.HLP — Dropped the SEED needed for VAX random numbers.

Moved to Modcomp this date, nowhere else.

2273. *January 11, 1985* New Modcomp .E, .R *Eric*

Created new link edit and task build files for NOTST programs:

VBANT.E VBANT.R UVAVG.E UVAVG.R

Moved to Modcomp this date, nowhere else.

2274. *January 14, 1985* VBLIN,VBLIN.HLP *John*

Modified VBLIN to accept user-specified antenna mount types in the VLB stations list, IN2FILE. Changes are described in VBLIN.HLP.

Moved nowhere.

2275. *January 14, 1985* AXSTRN *Eric*

Changed the format test for large (angular size) fields. It will now use sexagesimal for cell sizes less than 20 arc minutes (in RA and Dec) and 2 arc minutes (in longitudes and latitudes). Decimal degrees are used for larger cell sizes.

Moved nowhere.

2276. *January 14, 1985* IMLOD *Gary*

Changed to read an image with no points in order to be able to read and store the attached table file.

Moved nowhere.

2277. *January 15, 1985* CHKTAB *Pat*

Routine CHKTAB was incorrectly handling E and D formats. It was causing UVLOD to produce the message "String contains non-numeric characters" and resulted in incorrect telescope coordinates in the AN file.
Moved to VLA, nowhere else.

2278. *January 15, 1985* PATGN *Thad*

Routine PATHED was setting default increment value of 0. This value caused problems when other programs tried to use images created by this one. The value was changed to 1.0.
Moved nowhere.

2279. *January 15, 1985* UVLOD.HLP *Pat*

Range of NFILES increased.
Moved VLA, nowhere else.

2280. *January 15, 1985* CH2NUM, CHKTAB *Eric/Pat*

Standardized typing in CH2NUM and changed it to return an error code on error. Changed CHKTAB to test for the error and branch correctly.
Moved nowhere.

2281. *January 15, 1985* Modcomp driven *Eric*

More changes:

UVFLG — Dropped statement in KEYIN referring to uninitialized KEY8 and changed PACK to use INTEGER*2 and character copy rather than the illegal LOGICAL*1.

VM — Removed blank lines in CHALBT and GETIN. Corrected declaration order in VM, VMHIS, and GETIN. Created a BLOCK DATA routine to use VVMN.INC — one cannot initialize common with DATA statements otherwise. Did a great deal of fixing of the typing, but there's plenty left to do. Can only move the changes to the Modcomp.

APVC.E — Changed to TWOMAP.

AIPS.E — Combined some overlay segments to avoid overflowing the link editor.

Moved to Modcomp this date, nowhere else.

2282. *January 16, 1985* Misc. *Eric*

Miscellaneous last-minute changes:

UVFLG.E — Changed and moved since UVFLG now in NOTST.

UVFLG.R — Ditto.

WHATSNEW — Update to the 15-Jan-85 release.

PATGN — Thad's update of yesterday was deleted. It would have caused the loss of all of December's fixes and was not needed — the increments were fixed in the December corrections.

VM — Added the included EQUIVALENCE to two subroutines, thereby reducing the program size by 64K bytes. Made more minor typing changes. There may be a problem, however, but I cannot find any change which would have caused it.

Moved nowhere.

2283. *January 16, 1985* Undeclared *Kerry*

A massive effort was made to declare all items that were found to be undeclared in all the routines in AIPSUB, APLSUB, and SAPSUB. These included local variables as well as variables used in the definition of the subroutines (*i.e.*, dummy arguments) and functions. In several cases syntax errors and typos were also corrected. The routines changed in AIPSUB were:

AU1A	AU2	AU2A	AU3A	AU4
AU5	AU5A	AU5D	AU6	AU7
AU7A	AU8	AU8A	AUA	AUC
CATLST	CONCAT	CUBINT	GETFLD	GRLUTS
HELPS	HIENH	ICOVER	INIT	LTSTOR
MASSGN	PRTMSG	PSEUDO	QUICK	STORES
SUBS	SYMBOL	TVFIND		

The routines changed in APLSUB were:

ANTDAT	APXPOS	AXEFND	CATDIR	CATIO
COORDD	CTICS	DBINIT	DIRDEC	DWRITE
EXTCOP	GCHAR	GETHUT	GTWCRD	HDRINF
HICREA	HIINIT	LMDER	LMSTR	MAPFIX
MAPIO	MAPMAX	MOVIST	MSGWRT	NXTMAP
PEAKFN	SETVIS	SKYFRM	SNCRC	STRLIN
SUBHDR	TKSLIN	UVPGET	VERMAT	VISCHK

The routines changed in SAPSUB were:

APGRD1	APGRD2	APGRD3	APGRD4	APINT
APINTP	GRIDAP	PTSUB	QCVCON	QVTRAN
VTRANS	XFOUR.FOR			

Moved nowhere.

2284. *January 16, 1985* UNIX Z-routines *Kerry*

Finally, the Z-routines for UNIX have been hammered into a generic form (at least to first order) based on the 15JUL84 release of *AIPS*. Some 10–20% of the routines remain system specific for the most part because of known system bugs and to a lesser extent because of differences between various flavors/generations of UNIX. The "generic" versions reside in the subdirectories ....ZSUB.UNIX.GEN which also contain stubbed versions of those routines that are at least potentially system specific (*e.g.*, ZQTAPE). Those that have been developed for and are specific to the NRAO UNIX systems (Bell's System III UNIX on a Masscomp MC-500 and Amdahl Corporation's implementation of Bell's Version 7 UNIX called UTS on our IBM 4341 under VM) reside in the subdirectories ....ZSUB.UNIX.MC and ....ZSUB.UNIX.UTS, respectively. A fourth subdirectory ....ZSUB.UNIX.LOC is empty and is intended as the staging area for assembling the routines appropriate to the "local" system. As we receive the versions of routines that are specific to other UNIX systems (*e.g.*, 4.2 bsd, UNOS, HP-UX, etc.), subdirectories for these will appear. The empty directories created were:

[AIPS.15JAN85.AIPS.ZSUB.UNIX]	[AIPS.15JAN85.AIPS.ZSUB.UNIX.LOC]
[AIPS.15JAN85.APL.ZSUB.UNIX]	[AIPS.15JAN85.APL.ZSUB.UNIX.LOC]
[AIPS.15JAN85.NOTST.ZSUB.UNIX]	[AIPS.15JAN85.NOTST.ZSUB.UNIX.LOC]
[AIPS.15JAN85.NOTST.ZSUB.UNIX.MC]	[AIPS.15JAN85.NOTST.ZSUB.UNIX.UTS]
[AIPS.15JAN85.PSAP.ZSUB.UNIX]	[AIPS.15JAN85.PSAP.ZSUB.UNIX.LOC]
[AIPS.15JAN85.PSAP.ZSUB.UNIX.MC]	[AIPS.15JAN85.PSAP.ZSUB.UNIX.UTS]

Moved nowhere.

2285. *January 16, 1985* UNIX Z-routines *Kerry*

The Z routines created under the ...APL subdirectories are:

[...APL.ZSUB.UNIX.GEN]

DARCOS.FOR	DARSIN.FOR	IAND.C	IEOR.C
IOR.C	ZB2ASC.C	ZBYTFL.C	ZC8CL.FOR
ZCH2R4.FOR	ZCLC8.FOR	ZCLOSE.FOR	ZCMPRS.FOR
ZCPU.C	ZCREAT.FOR	ZDATE.C	ZDCHIN.FOR
ZDEACL.FOR	ZDEAMC.FOR	ZDEAOP.FOR	ZDEAXF.FOR
ZDELA2.C	ZDELAY.FOR	ZDESTR.C	ZDIR.FOR
ZDOPR2.C	ZDOPR3.FOR	ZDOPR4.FOR	ZDOPRT.FOR
ZENDPG.FOR	ZESTEX.C	ZEXIST.FOR	ZEXPND.FOR
ZFIO.FOR	ZGETCH.C	ZGNAME.FOR	ZGTBIT.C
ZGTBYT.C	ZGTDIR.FOR	ZI16IL.FOR	ZI32IL.FOR
ZI8L8.FOR	ZILI16.FOR	ZITOCH.C	ZLDFIL.FOR
ZM7OCL.FOR	ZM7OMC.FOR	ZM7OOP.FOR	ZM7OXF.FOR
ZMATH4.FOR	ZMIO.FOR	ZMOUNT.FOR	ZMOVE.C
ZMSGCL.FOR	ZMSGDK.FOR	ZMSGOP.FOR	ZOPEN.FOR
ZPARS.C	ZPHFIL.FOR	ZPHOLD.FOR	ZPTBIT.C
ZPTBYT.C	ZPUTCH.C	ZQASSN.C	ZQCLOS.C
ZQCREA.C	ZQDASS.C	ZQDEVN.C	ZQEXP.C
ZQIO.C	ZQIOV.C	ZQMSG.C	ZQOPEN.C
ZQRENA.C	ZQTAPE.C	ZQTRUN.C	ZQWIO.C
ZR42CH.C	ZR8P4.FOR	ZRENAM.FOR	ZTACT2.C
ZTACTQ.FOR	ZTAPE.FOR	ZTCLOS.FOR	ZTFILL.FOR
ZTIME.C	ZTKBUF.FOR	ZTKCLS.FOR	ZTKOPN.FOR
ZTKQIO.C	ZTOPEN.FOR	ZTREAD.FOR	ZTRSUM.C
ZTTYIO.FOR	ZTXMAT.FOR	ZWAIT.FOR	ZXHEX.C
ZXLOC.C	ZXLPRT.C	ZXMKTM.C	ZXMOUN.C
ZXMSGS.C	ZXSIGC.C	ZXTLOG.C	ZXTPIO.C
ZXXIST.C			

[...APL.ZSUB.UNIX.MC]

ZCH2R4.FOR	ZCLOSE.FOR	ZCPU.C	ZDATE.C
ZDCHIN.FOR	ZMSGCL.FOR	ZMSGDK.FOR	ZMSGOP.FOR
ZOPEN.FOR	ZQASSN.C	ZQTAPE.C	ZTACT2.C
ZTIME.C	ZTOPEN.FOR	ZTREAD.FOR	ZTTYIO.FOR
ZXMOUN.C			

[...APL.ZSUB.UNIX.UTS]

ZCPU.C	ZDATE.C	ZESTEX.C	ZGNAME.C
ZQASSN.C	ZQTAPE.C	ZTACT2.C	ZTIME.C
ZTTYIO.FOR	ZXMOUN.C	ZXSIGC.C	ZXTPIO.C

Moved nowhere.

2286. *January 16, 1985* UNIX Z-routines *Kerry*

The Z routines created under the ...NOTST and ...PSAP subdirectories are:

[...NOTST.ZSUB.UNIX.GEN]

ZCRDIR.C	ZTAPIO.C	ZUNADD.FOR	ZUNSGN.FOR

[...PSAP.ZSUB.UNIX.GEN]

ZP4I4.FOR	ZUNSGN.FOR

Moved nowhere.

2287. *January 16, 1985* UNIX Z-routines *Kerry*

The Z routines created under the ...AIPS subdirectories are:

[...AIPS.ZSUB.UNIX.GEN]

ZACTV8.FOR	ZACTV9.C	ZEXIT.C	ZFREE.FOR
ZKDUMP.FOR	ZPRMPT.C	ZSTAIP.FOR	ZSUSPN.C
ZTKILL.C	ZTQSPY.FOR	ZWHOMI.FOR	ZXFREE.C
ZXTSPY.C			

[...AIPS.ZSUB.UNIX.MC]

ZACTV8.FOR	ZACTV9.C	ZTKILL.C
ZXFREE.C	ZXTSPY.C	

[...AIPS.ZSUB.UNIX.UTS]

ZTKILL.C	ZXFREE.C	ZXTSPY.C

Moved nowhere.

2288. *January 16, 1985* Z routines *Gary*

Cleaned up some UNIX discovered things, such as unused or undeclared variables.

ZDIR	ZDOPRT	ZDOPR3	ZDOPR4
ZM70XF	ZMOUNT	ZACTV8	ZQMSIO

Moved nowhere.

2289. *January 16, 1985* DOCTXT:MV2C11*. *Kerry*

These new files contain the text of the installation guide for UNIX-*AIPS* in the same way that DOCTXT:MV2C10*. contains the text for the VMS-*AIPS* installation process.
Moved nowhere.

2290. *January 16, 1985* [...UNIX] *Kerry*

A new directory has been created to serve as a repository for all the procedures used in the installation, programming and maintenance of UNIX-*AIPS*. Under UNIX-*AIPS*, the execution search path is set to include this directory.
Moved nowhere.

2291. *January 17, 1985* Common Block Alignment Errors *Kerry*

Once again, some INCLUDE files were found to contain COMMON statements that produce alignment errors under operating systems that care about such alignments. In particular, the alignment errors are due to the placement of LOGICAL variables in the common block statements. Different operating systems support different LOGICAL lengths. Sometimes more that one length is supported; other times only one length is acceptable. Most systems accept either 2- or 4-byte LOGICALs. The common blocks should be arranged in descending order of item length, *i.e.*, 8-byte items followed by 4-byte items followed by LOGICAL variables (which may be 2 or 4 bytes depending on what the operating system supports) and finally 2-byte items. This does not solve the problem where the only accepted length for LOGICALs is 1 byte, however, under this scheme all LOGICALs are grouped together and moving them to the end of the COMMON definition is simplified. CMC.INC still produces alignment errors but is undergoing other changes that prevented its rearrangement at this time. In addition, a few declaration INCLUDE files were cleaned up. The INCS files changed were:

CEHD	CEVI	CGAI	CTHD	CUIN
CVC	DEHD	DTHD		

Moved nowhere.

2292. *January 17, 1985* Modcomp Z *Eric*

Routines which contain INLINE or pure assembly code may have to be changed to support the use of the $4E option (separate code, data, and constants pages). Changed were:

ZPRMPT — Added CTR 2 and CTR 3 statements. This Fortran routine with INLINE did declare a UFT in the assembly language part and, hence, required the use of the separate counters even when AIPS is linked as a one map task.

ZEXIS2 — Changed to work with counters 2 and 3 — it used CTR 1 before, since it (and the others below) is pure assembly language.

ZGETXT — Changed to work with counters 2 and 3.

ZTXMA2 — Changed to work with counters 2 and 3.

ZFREE2 — Changed to work with counters 2 and 3.

ZGTXNM — Changed to work with counters 2 and 3.

ZTQSPY — Changed to work with counters 2 and 3.

Moved nowhere.

2293. *January 17, 1985* Many *Gary*

Declared undeclared variables.

AVTP	CLIP	CORFQ	GREYS	IMEAN
PCNTR	PROFL	AIPMAN	BSTRT1	EXPTAP
CLIP	COMB	CORER	FITTP	FUDGE
GREYS	IMEAN	PROFL	PRTAN	PRTCC
PRTIM	PRTPL	PRTTP	PRTUV	QMSPL
SL2PL	SLFIT	SUBIM	SUMIM	TKPL
TRANS	UVCOP	UVPLT	UVSRT	XBASL
XGAUS	XPLOT	XSMTH	XSUM	AIPS
AIPSB	AIPSC	BATER	CATCHC	CATCHG
CATCHL	CATCHR	CATCHU	FILAI2	FILAIP
GRIPR	GRITP	GRTOTEX	POPSGN	PRNTMN
SETPAR	SETTVP	MCUBE		

Moved nowhere.

2294. *January 17, 1985* Clean up *Eric*

Removed computations from call sequences in APLDEA routines:

YGRAPH	YIMGIO	YINIT	YLUT	YSCROL
YZERO	YZOOMC			

Removed computations from call sequences in APLIIS routines:

YGRAPH	YINIT

Removed constants from calls in APLMC4 routines:

ZCLOSE	ZCMPR3	ZCREA3	ZCREAT	ZDELAY
ZDESTR	ZDOPRT	ZM70OP	ZPHOLD	ZTAPE
ZTREAD	ZWAIT			

ZDELAY had also not initialized NO, which is serious on Modcomps. Removed constants from calls in AIPMC4 routines:

ZKDUMP	ZTQSPY	ZWHOMI

Removed constants from calls in AIPS.ZPGM.MC4 routines:

MCDIRS	ZPREP	ZSTRTA

Moved nowhere.

2295. *January 17, 1985* M75 clean up *Eric*

In the APLM75 area, things were more complicated, but seemingly not serious enough to account for the reported problems with zoom:

YGRAPH — Removed computations in calls.
YINIT — Corrected error: N4 and N16 used, but not DATAed.
YRHIST — Corrected error: NO appeared as nO.
YSCROL — Corrected error: NO used, but not DATAed.
YSTCUR — Corrected error: NO appeared as nO.
YZOOMC — Corrected error: NO used, but not DATAed.

Moved nowhere.

2296. *January 18, 1985* ZACTV8 *Pat*

Increased length of VERSION string.
Moved VLA, nowhere else.

2297. *January 18, 1985* EXPFIT, IMPFIT *Eric/David/Kerry*

Two new service programs called EXPFIT and IMPFIT have been added to NOTPGM. EXPFIT writes *AIPS* source code on magnetic tape in FITS format. IMPFIT reads tapes generated by EXPFIT and writes the source code to disk generating directories as necessary. IMPFIT depends on two trivial Z-routines that have to date only been written for UNIX. These routines are called ZTAPIO (opens, reads and closes a tape device) and ZCRDIR (creates directories). In addition, IMPFIT is written to ANSI Fortran 77 standards but not to *AIPS* coding standards.
Moved nowhere.

Changes: 15-Jan-1985 version of *AIPS*

This section is intended normally to provide corrections and updates to the *AIPS COOKBOOK* in order to fill the gap between publication dates. The only changes for the period 15-Oct-1984 to 15-Jan-1985 are the additions of QWKPL to the general Help files INDEX, PL2D, and SL1D. Therefore, we will save some paper by not printing them out in the usual form.

It is our intention to publish updated versions of the *COOKBOOK* and of *Going AIPS*. Both could use some careful revisions, which could postpone the projects, unfortunately.

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A I P S L E T T E R

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A newsletter for users of the
*A*stronomical *I*mage *P*rocessing *S*ystem

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TEXset by EWG

Revised Procedures

During the past quarter, several of our management procedures have been revised substantially. Perhaps the most visible change in management is the change to a three-version system for the *AIPS* code on NRAO VAXes. The three versions are given the logical names TST, NEW and OLD and, at this time, correspond to the *AIPS* releases called 15OCT85, 15JUL85 and 15APR85, respectively. TST is the area of active development and will be used by NRAO staff to assist the programmers in their debugging. NEW will be used by most visitors to NRAO and will be changed as needed to correct bugs and major deficiencies. OLD will be the version used by our most cautious visitors and will be the frozen version shipped to non-NRAO sites. There will be automatic programs to insure that the versions of *AIPS* in Charlottesville and at the VLA site are the same. In this way, the programs will now undergo 3–6 months of testing at NRAO before any remaining bugs are "bestowed" on the rest of the world. In addition, the programmers at the VLA will be able to contribute to the project more effectively. This system is not fully established at this writing, but should be in place soon. As a result of this conversion, there was no official 15JAN85 release of *AIPS* and all future releases will be shipped on, or shortly after, the date given in their names. The *AIPSLETTER* now summarizes and lists the changes in NEW and TST separately. It also has new sections designed to assist programmers to follow all of the changes to the code.

We have completed and implemented an improved system for handling gripes, including a variety of software tools to make the task easier and more comprehensive. We now send acknowledgements of each gripe within a week of its receipt and some sort of answer at the end of the quarter in which it was received. All unanswered or otherwise "to be continued" gripes will be reissued to the programmers on a quarterly basis in an attempt to get more complete and final answers. The *AIPS* Wishlist has become a public document and a regular, observatory-wide discussion of its contents and priorities has been established. (See the article on AIPSPRIO below.) In addition, an *AIPS* Management Advisory Group has been formed. It consists of Alan Bridle (Chair), Bob Burns, Ron Ekers, Eric Greisen and Don Retallack and meets monthly to discuss management issues facing the *AIPS* group.

Summary of Changes: 15 January 1985 — 15 April 1985

These changes are listed in detail in the CHANGE.DOC files reproduced later in the *AIPSLETTER*. This section of the *AIPSLETTER* will have a new format henceforth. It will be divided into four parts, two for users and two for programmers, two for changes in the version now being released to non-NRAO sites and two for changes in the version now being released to visitors at NRAO sites.

We have been extremely busy this quarter — CHANGE.DOC has 43 entries in the NEW area and 226 changes in the TST area! The general thrust of our work has been to correct bugs in earlier releases and to rebuild some structures in order to improve the reliability of our system.

Changes of Interest to Users: 15APR85 as NEW

We change the code in NEW primarily to correct significant errors rather than to add noticeable new things. Due to the revision in our release procedures, most of our errors in the version called 15JAN85 were imposed only on the users of NRAO computers. An addition was made to allow all versions of *AIPS* to know which logical version (OLD, NEW or TST) they are. A major bug in DBCON which caused it to refuse to function was corrected. An error was corrected in MX which caused it to put incorrect frequencies in the output header and, in spectral-line cases, to subtract the components incorrectly from the *uv* plane. A variety of other, mostly technical, bugs were eradicated in the mapping subroutines. Corrections to APCLN and IMLOD were made to prevent integer overflows on large clean components tables and IMLOD was corrected to get the correct user number into the output header. A bug which prevented UVLOD from compressing its output files was corrected. Perhaps most importantly, the computation of the derivatives of the models used by IMFIT has been corrected. As a result, the task became much faster and much more likely to produce correct results. All previous versions should be regarded as unreliable, particularly in the answers given for the y position and the major and minor axis lengths of gaussian components and the orientation of the baseline slope. EXTLIST was changed to handle slice and "bad" input files without crashing AIPS.

Changes of Interest to Users: 15JUL85 as TST

All corrections described above were, of course, also made in TST. Moreover, we made a large number of additions, revisions, and corrections solely in TST. Five new tasks have been added. GNMRG merges two exactly parallel gain files, which is primarily of use on pseudo-continuum data sets. TASRT sorts any standard tables-format extension file. COPY runs only on VAXes and copies *AIPS* data between users, disks, and even DECNET nodes. POLCO corrects total polarization images for the bias due to noise. JMFIT fits gaussian components to images using a different method than, and many improvements over, IMFIT.

AIPS verbs and the *POPS* language processor received several improvements. The pseudoverbs STORE, SAVE, LIST and CORE may now occur on an input line with other commands. Those pseudoverbs which must be the only command on a line (EDIT, ENDEDIT, ERASE, GET, MODIFY, RESTORE, RUN and SCRATCH) have this requirement built into the processor more completely and all of the pseudoverb help files now explain things better. A $ anywhere in a *POPS* input line makes the rest of the line a comment. Array equates and the IF-THEN-ELSE construct are now more reliable. The functions ABS, MAX and MIN are now verbs. The latter two require two arguments and can handle arrays as well as scalars. The new verb GRDROP deletes a gripe submitted by the current user and the string \forget (or \FORGET) entered while typing a gripe causes the gripe to be terminated and ignored. The verb FREESPAC writes its output to the message file if the adverb PRTLEV is ≥ 1. PRTHI now uses the adverbs PRSTART and PRTASK to control the beginning point in, and the selection of entries from, the history file to be printed.

Among tasks, FILLR now uses the DOALL option and VM estimates the total flux if the input FLUX value is zero. IMLOD should again handle 32-bit tapes and SLICE should again honor blanking. LGEOM and friends

no longer mess up the input image header and history file — things they used to do when the input image was in floating point format. Problems with the message file on opens and aborts (on VAXes) should be corrected. And the TASKS help file is finally up to date.

Most of the big changes in the 15JUL85 release should not be particularly visible to the casual user. They are intended to make the system safer and more reliable. The most effort went to make all scratch files be catalogued as SC files with SCRATCH FILE as the name and the full task name as the class. These files appear in most catalog listings. The AJAX program no longer deletes active files and will seldom be required since SCRDEST, ABORT, EXIT and RESTART now delete all inactive scratch files belonging to the current user. The adverb BADDISK appears in all tasks which create scratch files and no longer appears in those that don't. Catalog files (type CA) are now simply directories which may expand as needed. The headers are stored in separate files of type CB. *AIPS* supports a new password system which is required for the *AIPS* manager account (user number 1) and optional for other users. The verb PASSWORD allows the user to add a 12-character password to his account or to change an existing one.

AIPS now supports three logical versions: TST, NEW and OLD (see article above). Batch was rearranged to have a QMNGR program manage all queues and to start each batch job (program AIPSB) with the desired version and disk assignments. Intertask communication was made simpler and more reliable. AIPS and AIPSB do not hang when a task aborts and, in fact, will discover that the task has aborted and perform appropriate error handling and scratch-file deletion. System parameters — minimum TIMDEST intervals, limits on batch execution of AP tasks, and the AP roller interval and priority parameters — are now under easy local control and can be modified simply by the *AIPS* manager to suite local conditions.

The system change which does have a direct impact on users has to do with RUN files. They are now stored with the user number as part of the name. On VAXes, they have the file name RUNFIL:*xxxx*.*usr*, where *xxxx* are any ≤ 8 characters (beginning with an alphabetic character) and *usr* is the user number in 3 hexadecimal digits (leading zeros required). *AIPS* releases now include RUN files of general interest under user number 1 and the RUN pseudoverb looks for the requested file under both the current user number and user number 1 (with minimum match, no less).

Changes of Interest to Programmers: 15APR85 as NEW

The code in NEW is changed only to correct errors and, as a result, most of the changes will have little obvious impact on programmers. In this quarter, the 15APR85 code was upgraded to include the full set of Z routines developed for UNIX operating systems (see 2325 and 2460). A Z-routine, ZMYVER, was retrofitted to the release so that programs, especially AIPS, can determine their default version identification (see 2319). Any program having a local copy of the CUVH common will need modification (see 2264 from last quarter and 2300).

Changes of Interest to Programmers: 15JUL85 as TST

All of the changes listed above were also made to the 15JUL85 release. That release contains numerous other changes of interest to programmers, especially in the area of scratch-file handling. All scratch files are now catalogued files of type SC. To do this, the files includes (*FIL.INC) were changed, dropping SCRFIL and MXSFDK and adding SCRCNO (see 2382, 2384). Subroutine SCREAT has replaced SNCR, SNCRB and SNCRC (see 2384, 2472). In addition, subroutines DESCR, FSWTC3, FSWTCH, MAPSNC, MERGE, CALCOP and UVDPAD have new call sequences (see 2384, 2419, 2448, 2470). The "WaWa" I/O package now supports the standard files common and uses the BADDISK adverb, although SCREAT cannot be used (see 2418, 2505, 2541).

The method by which intertask communication is handled was revised, probably making ZTRSUM and ZSUSPN obsolete (see 2387). A "process ID array" was added to the call sequences of ZACTV8, ZTACTQ and ZTKILL (see 2386, 2399, 2400). Batch is now handled differently leading to internal changes in ZACTV8 and ZACTV9, the movement of ZPRIO to the APL area, and a new ZSETUP routine (see 2552, 2562).

The catalog file (CA) is now purely a directory and headers are stored in CB files (see 2484). A password system was added leading to a new call sequence for RDUSER and a new ZPRPAS subroutine to read the passwords (see 2485). Passwords are optional for most users, but the *AIPS* manager account (user number 1) automatically has one which is also used by service programs. More system-dependent parameters are carried in the device common (includes *DCH.INC) and stored in the SP file, both of which have new formats (see 2487). This should reduce the need to revise the code locally to modify, for example, the TIMDEST limits and should allow, for example, the AP roller behavior to be optimized for local conditions. The package now supports three logical versions, adding TST to the list (see 2488).

Other changes to Z routines include new call sequences for ZDOPRT and ZFREE (see 2416, 2512). The VAX version of ZPHFIL now uses revised logical disk names (see 2489). Old versions of subroutines, especially those ending in 3, have gradually been replaced (throughout, especially 2458). Old routines which were deleted include APROLL, BPROLL, BPINIT, MAPSI3, SNCR, SNCRB, SNCRC, ZCMPR3 and ZEXIS3 (see 2470, 2472) as well as a few of no general interest.

A major package of RUN files has been developed to assist in verifying *AIPS* installations and the most fundamental programs (see 2397, 2481 and the article below). The *uv* gridding package was revised (see 2542) and DSKFFT has a new call sequence (see 2548). New subroutines to handle general and calibration tables have appeared (see 2360, 2361, 2452) and the limits on the use of METSCA have been made clearer (see 2357).

AIPS Publications

We are preparing new versions of the *AIPS COOKBOOK* and *Going AIPS* to correspond to the 15JUL85 release. These documents are lengthy and detailed so the job is not easy. We hope to have them ready for mailing by July 15, but that will depend on the backlog at NRAO's print shop as well as the backlog of other tasks awaiting the authors and editors of the books. Nonetheless, we have listed both on the *AIPS* Order Form at the end of this *AIPSLETTER*. Also listed there are the two *AIPS* Memos described below. Number 34 is already available and Number 35 will be available soon. Several other documents are also under preparation including a memo on the new three-directory setup and new versions of the basic *AIPS* Manual series.

AIPS Memo No. 34: "The *AIPS* Wishlist," Eric W. Greisen, February 1985.

> The informal "wishlist" maintained by the *AIPS* group has been converted to a document for discussion. The items are listed in the categories of (1) general maintenance; (2) projects in progress; (3) system improvements; (4) tasks; (5) miscellaneous; and (6) other. There is a general, but not specific, ordering by priority and some indication of who will do the work and what the chances are for the item to be done in 1985.

AIPS Memo No. 35: "*AIPS* Gripes Procedures," Donald C. Wells, Eric W. Greisen and Nancy D. Wiener, April 1985.

> This memo documents the procedures used to operate the GRIPES system. It is divided into three parts: a discourse on gripes, a description of the system by which they are to be managed, and a detailed manual describing the tools provided to do the management.

AIPS Priorities Discussion

Both *AIPS* and the "Wishlist" of desirable changes to, and augmentations of, the *AIPS* package have become very large. A recent version of the *AIPS* Wishlist is available as *AIPS* Memo No. 34 (see above). Manpower limitations are such that many items on the Wishlist may have to be deferred for several years. We have, therefore, begun an observatory-wide discussion of scientific priorities for the development of *AIPS*. There are bimonthly telephone meetings among the various NRAO sites to discuss *AIPS* priorities, and users are welcome to participate in any of these meetings which take place while they are visiting one of the sites. There is also an ongoing VAXmail "conference" in which contributions from non-NRAO *AIPS* users would be welcomed. This conference is divided into the following six topics:

1. TASKS: What features of existing *AIPS* tasks and verbs most limit synthesis data reduction now, and therefore deserve high-priority attention? MX, ASCAL, UVSUB, others?

2. SYSTEM: What features of the existing *AIPS* system most limit synthesis data reduction now, and therefore deserve high-priority attention? Problems with batch, catalog structures, inefficiency of big back-ups, other things?

3. NEW SOFTWARE: What new software is most urgently needed within *AIPS*? Calibration (VLBA interface), single-dish applications, full *AIPS* in a supercomputer, others?

4. DOCUMENTATION: What documentation improvements are most likely to lead to better informed *AIPS* use, *e.g.,* a new *COOKBOOK*, a "Help/Explain" manual, other?

5. DEBUGGING: How might we improve debugging of new *AIPS* releases?

6. WISHLIST: Are there important items missing from the *AIPS* Wishlist and/or do you wish to see any items substantially upgraded or downgraded on the list? (Which, and why?)

AIPS users are welcome to contribute to the VAXmail conference by writing to Alan Bridle in Charlottesville or, at any time that they have access to the NRAO DecNet system, by sending VAXmail to CVAX::BRIDLE. Each contribution will be categorized to one or more of the above topic areas and will then be forwarded by VAXmail to dedicated logins called AIPSPRIO on the Charlottesville VAX (CVAX) and on VAX3 at the VLA. You may read the current contributions to the conference by logging in to AIPSPRIO on either of these machines. This login is a captive account that automatically invokes the VAXmail program and executes only that program. Type `dir task` to review the titles of the contributions about "tasks." Type `dir syst`, `dir news`, `dir docu`, `dir debug` and `dir wish` to review the titles of the contributions to the other topics. Then use the VAXmail `read` command to read individual contributions.

The Portability Column

CPU/OS Combinations

Generic UNIX Kits: About a dozen kits were shipped in February and March; a number of target CPU/OS combinations were represented.

MASSCOMP MC-500/Sys.III: Kerry made a several test installations of *AIPS* on the Green Bank Masscomp in the process of checking the UNIX-*AIPS* distribution kit early in the quarter, before the Cray/COS project really got going. The magnetic tape interface now works.

Nord ND-500/Sintran: This 32-bit computer should be equal, or superior, to a VAX780 for many applications. In principle, it may have a special advantage for vector applications like *AIPS* due to microcoding which implements pipelining in the arithmetic hardware (the subroutine library generally follows the FPS AP-120B conventions). Bill Cotton prepared the following report entitled "Verification of *AIPS* on the Onsala NORD-500, 18 February—1 March 1985" for Onsala after his trip to Sweden:

"Upon my arrival at Onsala, the *AIPS* system was running quite well on the Nord considering the rather primitive operating system. Lars-Goran Sjogren of Luleo is to be highly commended for an excellent job of both setting up the mechanics of running *AIPS* and for the maintenance and updating of the software. Since Sintran, the Nord operating system, cannot perform many of the functions which *AIPS* expects of an operating system (such as file creation and process initiation), Lars-Goran wrote a monitor program for *AIPS* called AIPSMON to handle the many functions missing in Sintran. ... Some of the Nord microcode array processing routines were implemented. However, the FFT routines were determined to return incorrect results and their usage has been deferred until they are fixed."

"Verification that the software gave the correct answer and timing tests were done by a suite of routines on a standard test set of data; results were compared with those derived on an NRAO VAX+AP system. These results were in agreement at the level expected due to minor changes made in one of the mapping routines (*i.e.*, $\approx 0.01\%$); better agreement is expected after the next update of *AIPS*. The real time used for a representative mix of tasks in otherwise empty computers was 130 minutes on the Nord and 30 minutes on a VAX+AP. Much of this timing difference is due to the serious mismatch on the Nord between the CPU and disk access speeds. There are two areas in which the performance of the Nord *AIPS* system could be improved. The first is implementing correctly microcoded FFT routines; this will probably result in a 20–30% overall speedup of the system. A second area with much larger potential payoff, but which requires substantial work by Nord, is to enhance the pathetic I/O performance of the machine. In summary, the *AIPS*-Nord system appears to be running smoothly, if considerably more slowly than expected. The system behaves well under heavy loading and the compiler generates code which (almost always) gives the correct answer."

Product Review

ELXSI 6400/EMBOS: On February 8, two representatives of ELXSI (2334 Lundy Place, San Jose, CA 95131, telephone 408-942-0900) visited NRAO's Charlottesville offices. The ELXSI 6400 is unusual in that it is explicitly designed to have more than one CPU, and to allow both the operating system and user applications to exploit a variety of opportunities for parallelism. Parallel processes synchronize by passing messages (EMBOS is an acronym for "ELXSI Message-Based Operating System"). The individual CPUs are 64-bit computers with performance of about 6 million instructions per second (comparable to, or somewhat faster than, the new VAX8600). On the "Livermore Loops," the 6400 currently has a rating of about one MFlop; we estimate that it might beat a 780+AP by as much as 50%. The bus bandwidth of the 6400 is very high (320 MB/sec), and ELXSI asserts that the 6400 system exhibits an almost linear increase in processing power as extra CPUs are added to the system (up to five will fit into the basic cabinet).

Installing *AIPS* on the ELXSI should be straightforward because EMBOS resembles and emulates UNIX. For an *AIPS* installation, it might be attractive to have two CPUs and to use the second one to execute the *AIPS* pseudo-array processor code. Another option, one which is probably even more attractive, would be to add a Numerix MARS-432 to a single CPU ELXSI (ELXSI has a marketing agreement with Numerix). We note that ELXSI has sold an impressive number of machines during the last year, and therefore some potential *AIPS* site may discover that it has one of these high-powered CPUs available to it. We end this product review with our usual caveat: *"Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it."*

Supercomputer News

During January and February, Bob Duquet and Tim Cornwell adapted a stand-alone version of VM to run on the Vector Production Cray X-MP. Several large maps were processed with this program and much was learned about the billing algorithms, I/O efficiency, etc. In general, I/O charges appear to loom relatively large in synthesis mapping with supercomputers. These charges can be strong functions of parameters such as hardware configuration and map size. For example, at Vector Production, the dollar cost of executing the experimental VM program is approximately proportional to the *cube* of the image size! The ability to compute very large maps can however offer advantages which can justify unusually large costs. In one experiment, map artifacts were disclosed in a 4096x4096, high-resolution map which had not been seen clearly in lower resolution maps made from the same data; these were later traced to bad data.

The effort to adapt *AIPS* to the COS operating system began in March and steady progress has been made by Bob Duquet and Kerry Hilldrup. The status of the project at the end of the current quarter was succinctly summarized by Bob on 17 April: "Yesterday afternoon, Kerry and I got POPSGN to run through to completion and, shortly thereafter, we got a skeletal version of AIPS to run also. (*Very* skeletal!!)." Great progress has been made in the days since the quarter ended. Program AIPS is no longer skeletal and now appears to run most of the language processor as well as basic verbs like HELP, INPUTS, and PRTMSG. The verb GO and the task DISKU have also been executed with apparently correct results! We'll report continuing progress in the next *AIPSLETTER*.

In March, NRAO submitted a conceptual proposal entitled "A Supercomputer for Radio Astronomical Imaging" to the NSF. Although this is not an *AIPS*-group project, some of the *AIPS* programmers, as well as a number of other people at the VLA and in Charlottesville, were heavily involved from November through March preparing this document. The document considers the multitudinous technical details of the entire proposed facility and its operation, even though the current document is not the final proposal. New information from the VM and *AIPS* on the Cray projects was folded into the document as well. In addition, near the end of the quarter, NRAO submitted a request to the NSF to extend the grant of time at Vector Production in order to continue gaining experience in the use of supercomputers for synthesis mapping and to continue the project to install *AIPS* under COS.

AIPS Workshop

We are beginning to make plans to hold an *AIPS* Workshop in Charlottesville on October 24–25. These dates have been chosen because they adjoin an NRAO Users' Meeting on October 23–24 and the Jansky Lecture by G. R. Burbidge on October 22.

The Workshop will attempt to achieve a dialog between *AIPS* users and the *AIPS* group on a wide variety of topics relating to present and future *AIPS*. These topics could include transporting and installing *AIPS*, optimum use of *AIPS* for different types of data reduction and at different installations, coding in *AIPS*, the contents and priorities of the *AIPS* Wishlist, and recent and intended developments in *AIPS*.

At this time, we would like to solicit suggestions from all *AIPS* users for topics you would like to see included in such a workshop. Volunteers to make presentations would also be welcome. Please send your suggestions to Alan Bridle in Charlottesville (VAXmail CVAX::BRIDLE, phone 804–296–0375).

AIPS Certification and Benchmarking Package

There is now an *AIPS* certification and benchmarking package. It consists of two large RUN files containing *POPS* code, mostly in the form of procedures, and a tape of *uv* and map images. The procedures execute a specific sequence of *AIPS* tasks on the real datasets found on the tape and compare the computed results with those, also found in the tape, computed by another (presumably correct) *AIPS* system. The package is intended to be used as the prime test to certify that a new *AIPS* installation, such as the Cray under COS, is correct. In addition, the PRTACC utility program is used to print timing data for benchmarking purposes. At the present time, the package directly verifies the correct operation of the programs AIPS, IMLOD, UVLOD, UVSRT, UVMAP, COMB, APCLN, SUBIM, ASCAL, MX, CNVRT and VM. The *AIPS* programmers refer to this list as the "Dirty Dozen." Task FITTP is also tested indirectly. The current RUN files, PFTLOAD and PFTEXEC, are designed to run on a fairly small data set, but they may be cloned easily for larger problems.

The *AIPS* programmers have already used the package to test *AIPS* installations on several machines: VAX780, VAX780 plus AP, Modcomp plus AP, IBM under UTS, and NORD-500. In addition to its use for certification of *AIPS* on new architectures, the test package has several more subtle, but no less vital, applications. *It can be, and already has been, used to certify that revisions to tasks are okay and that an AP's hardware is functioning correctly (or, conversely, to detect hardware failures).* The package is nearly ready for "β-testing"; when testing is complete, perhaps by 15JUL85, it will become a line-item on the *AIPS* order form. We also expect to report comparative benchmark data in future *AIPSLETTER*s.

The Gripe Column

Responses to hundreds of gripes have been sent to users during the quarter; many of these were actually *final* answers. Revised answers to a substantial number of the "to-be-continued" gripes have also been sent. At the end of the quarter, all outstanding gripes were reprinted, ordered by programmer and subject, so that the *AIPS* programmers all have up-to-date copies.

Here is a gripe from last fall and our response to it:

Gripe: "The gripe system seems to have fallen into disuse. Why is this not admitted? It seems to have become a waste of everyone's time, and I fear it raises false hopes of getting the bugs fixed in a reasonable time."

Response: "The coincidence of timing here may be fortuitous, but it is no less ironic: your gripe was received and read in CV less than 24 hours after you had entered it! Gripes are *not* a waste of time; the bugs *do* get fixed (read CHANGE.DOC in the *AIPSLETTER* to see). It is true that the return of gripe *responses* to the persons who entered them has often been delayed, and this could easily lead to the mistaken impression that the *AIPS* programmers don't take them seriously."

In fact, the *AIPS* programmers do take the gripes *very* seriously; every one is read at least twice by two different people and most are read by three or more people. With improved tools and a new person (Nancy Wiener) to manage the details, we hope that our gripe response time will now reflect our commitment to operating a software problem report system to the better satisfaction of our users. Site managers should note that we still stand ready to accept and process gripes received by magnetic tape from non-NRAO sites. (Use the service program GRITP.) *AIPS* Memo No. 35 describes our gripes procedures in detail (see above and the Order Form).

CHANGE.DOC: 15APR85 Version as NEW

2298. *January 21, 1985* MX *Bill*

MXMAP now takes the peak of the first map as the RESMAX when starting or restarting. This (may have) caused the 0-residual problem when restarting with multiple fields.
Moved from 15JUL85 (5-Feb), to the VLA (6-Feb).

2299. *January 21, 1985* XGAUS *Gary*

I messed up a statement in subroutine PSCALE during the variable declaration frenzy (see entry 2293).
Moved from 15JUL85. Will be on all tapes.

2300. *January 22, 1985* DBCON *Eric*

When new variables were added to the *uv* header common (CUVH.INC) the corresponding variables were not added to DBCON causing a misalignment to occur when UVH was copied (twice) to local common areas in DBCON. Changed DDBC.INC and CDBC.INC to declare the new variables and a revised address correction variable IDUM. Changed DBCON to copy the 3 new words. Also changed DBCON.E to declare the correct overlay structure (DBMNGL was not overlayed).
Moved code changes only from 15JUL85 (14-Feb) and to VLA (19-Feb), nowhere else.

2301. *January 22, 1985* User number *Eric*

IMLOD was cataloging the input under the logon user number but putting the FITS tape user number in the image header. This made trouble for later programs. Corrected this in subroutine RENAME by seeing that the final header has the logon user number and that it is written to disk (which it was not previously!). Also changed AU7A and PUTHEAD.HLP to allow PUTHEAD to change the user number in the header so long as it is changing it to the logon user number. Also corrected IMLOD.E and IMLOD.R to put them in NOTST and to show the new overlay structure.
Moved nowhere, IMLOD moved from 15JUL85 (5-Feb) and to VLA (29-Jan).

2302. *January 23, 1985* CHKTAB *Gary*

Subroutine was not decoding fractional part of the format for E and D formats correctly.
Moved from 15JUL85 (5-Feb) should go to the VLA.

2303. *January 24, 1985* ASSIGN *Eric*

ASSIGN, used by *POPS* to move adverb values from one adverb to another, did it badly in that it zero- or blank-filled the output first, then copied the input to the output. This means that APARM = APARM, for example, was a good way to set APARM to 0. This is an unusual operation, but calling a procedure using the argument that appears in the procedure definition is not. Anyway, I changed the order to do the copy followed by any needed blank or zero fill.
Moved from 15JUL85 (5-Feb) should go to the VLA.

2304. *January 29, 1985* IMLOD, APCLN *Pat*

Both IMLOD and APCLN were incorrectly setting the extend size of table files. This was leading to integer overflows in routine TABIO. In addition, IMLOD was failing to interpret INTEGER*4 items from a FITS header correctly. This was also causing integer overflow.
Moved to VLA, IMLOD from 15JUL85 (5-Feb), APCLN from 15JUL85 (14-Feb).

2305. *January 31, 1985* IMLOD *Gary*

In MAKTAB, IRNO was declared I*2 instead of I*4.
Moved from 15JUL85 (5 Feb 85) should go to the VLA.

2306. *February 6, 1985* MX *Pat*

The frequency axis of all files created by MX was incorrectly labelled. This was causing several problems in spectral line and bandwidth synthesis modes. In particular, fields well away from the phase reference position were having components subtracted with incorrect *uv* values for frequency channels away from the reference frequency. The only problem in continuum mode was the incorrect label for the frequency. This may have some impact on very accurate spectral index calculations. Note that to restart cleaning with an existing map made with previous versions of MX the map frequencies will need correcting with PUTHEAD.

The behaviour of MX when OUTSEQ = 0 has been changed. It now scans the beam and all maps it is creating to ensure that the sequence number it chooses is unique for all of them. Previously it was only scanning the beam file.

Moved to VLA this date, from 15JUL85 (14-Feb), nowhere else.

2307. *February 6, 1985* MX *Bill*

Fixed problem with handling histogram maximum in MXRHIS. Changed (fixed?) handling of residual loading in MXMPAC. Fields with 1 residual are ignored.

Moved from 15JUL85 (14-Feb), nowhere else.

2308. *February 7, 1985* ALGSUB *Bill*

DATAed the value for ZERO (=0).

Moved to Modcomp this date, from 15JUL85 (14-Feb).

2309. *February 7, 1985* MX *Bill*

Removed branch into DO loop introduced in frequency fix-up.

Moved from 15JUL85 (14-Feb), nowhere else.

2310. *February 10, 1985* VM *Tim*

I have attempted to fix the errors introduced by others in this splendid and noble program. I have removed typing changes but have retained "new improved TV routine." Also updated Help file to reflect possibility of higher gain values, *e.g.,* 0.3 seems to work well.

Moved to 15JAN85 at VLA, from 15JUL85 (14-Feb).

2311. *February 11, 1985* APIO *Bill/Kerry*

Made new variable IBIGNX declared I*2 and set equal to BIGNX. IBIGNX is sent to MINI3.

Moved these code changes from 15JUL85 (14-Feb), nowhere else.

2312. *February 11, 1985* MX *Bill/Kerry*

In MXUNIF, JNYMIN was misspelled JYMIN; this may have caused some of the problems reported with uniform weighting.

Moved this change from 15JUL85 (14-Feb), nowhere else.

2313. *February 11, 1985* UVMAP *Bill*

Added call to QWD in MAPOUT before call to QCRVMU. This cured a timing problem on the Modcomp.

Moved to Modcomp this date, from 15JUL85 (14-Feb), nowhere else.

2314. *February 11, 1985* VM *Tim*

Reintroduced broken version of VM after fixing problem. A spurious variable BSCL had been introduced by someone "correcting" my typing. Might even work on the Modcomp, someone should move it there soon.

Moved to 15JAN85 at VLA VAXes, from 15JUL85 (14-Feb), nowhere else.

2315. *February 12, 1985* UVMAP *Bill*

Removed I*4 from calls to MINI3.

Moved from 15JUL85 (14-Feb), nowhere else.

2316. *February 12, 1985* APIO *Bill*

Changed TWOONE to I*4, changed call to QPUT, QGET.
Moved these changes only from 15JUL85 (14-Feb), nowhere else.

2317. *February 12, 1985* UVMAP *Bill*

Removed I*4 from calls to MINI3.
Moved from 15JUL85 (14-Feb), nowhere else.

2318. *February 12, 1985* PASS1 *Bill*

Changed I*4 in call to APXPOS (NCOL) to I*2.
Moved from 15JUL85 (14-Feb), nowhere else.

2319. *February 13, 1985* MYVERS *Eric/Gary*

AIPS and BATER have to know the default version for activating tasks, finding Helps, etc. In the past, this parameter was set via DATA statements which had to be changed when the current program became the OLD version of itself. This was rarely done, in fact, so the OLD version had the wrong defaults. Changed the VAX procedures AIPS.COM and BATER.COM to set a logical to DEFVER (and removed block of OLD version). Also changed the Fortran as:

ZMYVER — (VAX) New: Inquires setting of logical DEFVER and sets the VERNAM parameter accordingly.
AIPS — Removed MYVERS parameters, added call to ZMYVER.
BATER — Removed MYVERS parameters, added call to ZMYVER.

Moved these changes in AIPS, BATER, ZMYVER (VMS) from 15JUL85 (14-Feb), nowhere else.

2320. *February 15, 1985* MX *Bill*

Fixed bug in MXUNIF introduced in AP interface upgrade. In loop 300, KTEMP set to IROW + 1.
Moved from 15JUL85, this date.

2321. *February 19, 1985* UVLOD *Kerry/Eric*

UVLOD was failing to compress its output files due to an error (it said CAT3(K3GCN) = F9 rather than F9 = CAT3(K3GCN) !).
Moved from 15JUL85 and the VLA this date, nowhere else.

2322. *March 1, 1985* IMFIT *Fred*

The pathetic behavior of IMFIT was due, in large part, to the fact that the minimization routine was not being sent correctly computed partial derivatives of Gaussian models. Three of the six partials were computed wrong: the derivatives w.r.t. y-position, major axis length, and minor axis length. So, except in cases where these parameters were held fixed, the minimization routine did little but flop around. This evidently explains why it has always been necessary to do parameter "tweaking" after the fit.

The three necessary changes were made within the subroutine IMFMOD. In the case of a 12-parameter fit — two Gaussians, noiseless data, and a 41 × 41 data array — the exact parameters were obtained after this repair, in about 5 min. CPU time. The earlier, bad version of IMFIT would have taken in excess of 40 min. CPU time to produce the wrong answer for this test case (I didn't allow it to finish).

I noticed several other more minor problems: I don't like the way that errors are calculated, I don't see any need for the post-fit parameter tweaking, and I don't believe that the Gaussian-component position angle is handled properly, except for the standard orientation of the right ascension and declination axes. I'll try to work out remedies for these problems, and I may try out an alternative minimization algorithm as well.

Moved from 15JUL85 and to the VLA this date, nowhere else.

2323. *March 5, 1985* APIO *Kerry*

Changed ZMATH4 argument (ONE) from true I*4 to properly initialized pseudo I*4 variable. An error only a word flipped machine like the VAX would miss. MX now works on the IBM (at least for CMETHOD = 'GRID') and will probably work on the Modcomp, Masscomp and Cray. A problem with CMETHOD = 'DFT' still exists that is probably due to a similar error in VISDFT or its dependencies.
Moved from 15JUL85 this date.

2324. *March 8, 1985* IMFIT *Fred*

There was another fairly serious error in the subroutine IMFMOD. The partial derivative of the model baseline with respect to the third baseline parameter, t, the "orientation of the slope," was computed incorrectly. The subexpression which ought to have been $y \cos t - x \sin t$ had, instead of t, the *sixth* baseline parameter ("orientation of major axis curvature") as the argument of the sine and cosine functions.
Moved from 15JUL85 this date.

2325. *March 9, 1985* UNIX Z-routines *Kerry*

As part of the port of the 15JAN85 version of *AIPS* to the IBM under UTS, the Z-routine changes that had occurred since the last port (15JUL84) were implemented for UNIX. Some of these routines are stubbed because they still require development under UNIX. In addition, some routines have undergone minor changes. The full lists of routines are given in the 15JUL85 CHANGE.DOC entries.
Moved from 15JUL85 this date.

2326. *March 15, 1985* SAPSUB:QGRD1,2,3.FOR *Bill*

Fixed bug in table lookup of convolving function values; X and Y were reversed.
Moved from 15JUL85 this date.

2327. *March 25, 1985* ALGSUB *Bill*

Fixed problem with 2048 and larger images. The routine will now reduce the size of the interpolation kernal if necessary to make the problem fit.
Moved from 15JUL85 this date, nowhere else.

2328. *March 25, 1985* GRDSUB *Bill*

Fixed problem with multiple fields with separate input and output files. Input file to ALGSUB is now the output file for fields past the first.
Moved from 15JUL85 and to VLA this date.

2329. *March 29, 1985* ZFREE *Gary*

ZFREE was not handling multi-volume disks correctly under some circumstances (the name string length was not getting updated). Also ZFREE would not do more than one logical name translation. This has been fixed.
Moved from 15JUL85.

2330. *April 3, 1985* TVLABEL *Eric*

Modified the help file for TVLABEL to take TVWLABEL into account and created a help file for TVWLABEL which I forgot to do long ago.
Moved from 15JUL85, nowhere else.

2331. *April 4, 1985* UVMDIV *Bill*

Variable XNCC was misspelled (XXNCC) in the test for a point model.
Moved from 15JUL85, nowhere else.

2332. *April 4, 1985* EXTLIST *Eric*

Corrected AU8A for a format error on the "file contains garbage" message and for the test on slice files which erroneously caused the routine to branch to the offending message.
Moved from 15JUL85, nowhere else.

2333. *April 4, 1985* Help files *Eric*

Minor fixes to the help files for:
CONVL — BLC and TRC description was reversed in inputs part.
SUBIM — Changed limits to allow XINC and YINC of 0.0.
TVMOVIE — Verb uses DOCIRCLE not DOCENTER.
Moved from 15JUL85, nowhere else.

2334. *April 8, 1985* VISDFT *Bill*
Added an AP timing call to VISDFT.
Moved from 15JUL85.

2335. *April 9, 1985* UVDOUT *Bill*
Fixed bug in logic causing the weights to be inversely proportional to the model amplitude.
Moved from 15JUL85, nowhere else.

2336. *April 9, 1985* BSTRT1 *Gary*
Variable VERSON was not updated to the new length. I fixed it.
Moved from 15JUL85, nowhere else.

2337. *April 15, 1985* ZMSGOP *Pat*
Since VMS version 4.0 there have been occasional problems with shared terminals returning "Device not ready" status and the offending tasks crashing. This is an attempt to fix the problem.
Moved from 15JUL85 (22Apr).

2338. *April 18, 1985* TABHDR *Bill*
Corrected bug in cracking field format which caused an array to overflow.
Moved nowhere from 15JUL85.

2339. *April 18, 1985* VBFIT, VBCOR *Bill*
Now computes a pointer for the weights which was sometimes unset and sometimes incorrectly set, in general VBFIT was doing the right thing (except for polarization data) and VBCOR was in general incorrect.
Moved nowhere from 15JUL85.

2340. *April 22, 1985* UVEXP *Gary*
This program could crash when GST at IAT=0 was over 360 degrees. Put in a DMOD.
Moved from 15JUL85.

CHANGE.DOC: 15JUL85 Version as TST

2341. *January 21, 1985* MX *Bill*
MXMAP now takes the peak of the first map as the RESMAX when starting or restarting. This (may have) caused the 0-residual problem when restarting with multiple fields.
Moved to 15APR85 (5-Feb), to the VLA (6-Feb).

2342. *January 21, 1985* XGAUS *Gary*
I messed up a statement in subroutine PSCALE during the variable declaration frenzy (see entry 2293).
Moved to 15APR85. Will be on all tapes.

2343. *January 22, 1985* DBCON *Eric*
When new variables were added to the *uv* header common (CUVH.INC) the corresponding variables were not added to DBCON causing a misalignment to occur when UVH was copied (twice) to local common areas in DBCON. Changed DDBC.INC and CDBC.INC to declare the new variables and a revised address correction variable IDUM. Changed DBCON to copy the 3 new words. Also changed DBCON.E to declare the correct overlay structure (DBMNGL was not overlayed).
Moved code changes only to 15APR85 (14-Feb) and VLA (19-Feb), nowhere else.

2344. *January 22, 1985* ASSIGNP *Eric*

Added logical symbols AIPER, APLER and NOTER to point to the ZPGM.MC4 areas in which the Modcomp .E and .R files are stored.
Moved nowhere.

2345. *January 22, 1985* User number *Eric*

IMLOD was cataloging the input under the logon user number but putting the FITS tape user number in the image header. This made trouble for later programs. Corrected this in subroutine RENAME by seeing that the final header has the logon user number and that it is written to disk (which it was not previously!). Also changed AU7A and PUTHEAD.HLP to allow PUTHEAD to change the user number in the header so long as it is changing it to the logon user number. Also corrected IMLOD.E and IMLOD.R to put them in NOTST and to show the new overlay structure.
Moved nowhere, IMLOD moved to 15APR85 (5-Feb) and VLA (29-Jan).

2346. *January 23, 1985* CHKTAB *Gary*

Subroutine was not decoding the fractional part of the format for E and D formats correctly.
Moved to 15APR85 (5-Feb) should go to the VLA.

2347. *January 24, 1985* APCLNK, NAPCLNK *Gary*

Changed to use logical name FPS instead of a hard coded [FPS] in these VAX procedures.
Moved nowhere.

2348. *January 24, 1985* ASSIGN *Eric*

ASSIGN, used by *POPS* to move adverb values from one adverb to another, did it badly in that it zero- or blank-filled the output first, then copied the input to the output. This means that APARM = APARM, for example, was a good way to set APARM to 0. This is an unusual operation, but calling a procedure using the argument that appears in the procedure definition is not. Anyway, I changed the order to do the copy followed by any needed blank or zero fill.
Moved to 15APR85 (5-Feb), should go to the VLA.

2349. *January 24, 1985* GNMRG *Bill/Eric*

New task: merges two gain files, replacing one of the IF solutions of the first gain table with a specified IF of the second gain table. The task is very limited: the gain tables must have been derived from the same data set and must have the same normalization. New files: GNMRG.FOR, GNMRG.HLP, GNMRG.E and GNMRG.R.
Moved to Modcomp this date, nowhere else.

2350. *January 24, 1985* GRITP, GRTOTEX *Eric*

Changed GRITP to accept both lower and upper case responses. Changed both to use ZFIO rather than ZFI3. Modified typing a bit in GRTOTEX.
Moved nowhere.

2351. *January 28, 1985* ZMSGOP *Gary*

If an abort occurred while a task was doing a Fortran write to unit 6, a recursive I/O call could occur when the exit handler called MSGWRT to write the abort message. This was fixed by putting error traps on the Fortran writes.
Moved nowhere.

2352. *January 29, 1985* PRTCC *David Garrett/Kerry*

OUTLUN was being set to 5 instead of 6 for DOCRT = TRUE.
Moved nowhere (fortunately — *Eds.*).

2353. *January 29, 1985* IMLOD, APCLN *Pat*

Both IMLOD and APCLN were incorrectly setting the extend size of table files. This was leading to integer overflows in routine TABIO. In addition, IMLOD was failing to interpret INTEGER*4 items from a FITS header correctly. This was also causing integer overflow.
Moved to VLA, IMLOD to 15APR85 (5-Feb), APCLN to 15APR85 (14-Feb).

2354. *January 31, 1985* IMLOD *Gary*

In MAKTAB, IRNO was declared I*2 instead of I*4.
Moved to 15APR85 (5-Feb); should go to the VLA.

2355. *January 31, 1985* Installation Procedure Changes *Gary*

Fixed some bugs and made a few changed in the following:
ILOAD.COM ISHORTINS.COM ICREATE.COM
Moved nowher;, should be used in VLA installation.

2356. *January 31, 1985* VM *Tim*

VM was broken by some of the previous changes made by Eric and Bill. To try to fix this I modified the 15OCT84 version to include the Q routines and put it in place of the broken version. The broken version can be obtained from me if anyone wants to fix it. May I suggest that programs are tested after modification? It seems pointless to port a program to the Modcomp but then not test it, and careless to break the working VAX program.
Editor's note: The program was tested and the failure was worked on extensively. However, the structure of the code, the fact that the 15OCT84 version did not work (floating overflow), and the fact that Tim was away for 2 months made debugging very difficult.
Moved nowhere.

2357. *February 1, 1985* METSCA *Eric*

At Pat's suggestion, I changed the precursor remarks to point out the limits in the formats which should be used on the output from METSCA. I also changed it to prevent numbers greater than 999.949. Thus F6.1, F7.2, F8.3 are acceptable, safe formats. Format F5.0 is not acceptable (if negatives can occur).
Moved nowhere.

2358. *February 5, 1985* FILLR *Bill*

Added DOALL option. Will now write multisource, indexed *uv* data files. Also changed FILLR.HLP, DFLR.INC, CFLR.INC, DMC.INC and CMC.INC.
Moved nowhere.

2359. *February 5, 1985* TASRT *Bill*

New task to sort *AIPS* tables extention files. Attempts to sort on all data types but may have some trouble with long character strings and bit strings. Also TASRT.HLP
Moved nowhere.

2360. *February 5, 1985* Tables routines *Bill*

Added a number of new tables routines:
TABKEY — Reads/writes keywords from/to tables headers.
TABSRT — Sorts tables, calls ITBSRT, ICSORT, OTBSRT.
ITBSRT — Sets up, reads file, does incore sort as input to MERGE.
ICSORT — Incore sort.
OTBSRT — Reformats scratch file into new file.
GAINI — Initializes/creates, etc. GAIN tables.
TABGA — Reads/writes GAIN tables.
NDXINI — Initializes/creates, etc. INDEX tables.
TABNDX — Reads/writes INDEX tables.
FLGINI — Initializes/creates, etc. FLAG tables.
TABFLG — Reads/writes FLAG tables.
SOUINI — Initializes/creates, etc. SOURCE tables.
TABSOU — Reads/writes SOURCE tables.
CHNDAT — Reads/writes channel (IF) tables.
Moved nowhere.

2361. *February 5, 1985* Calibration routines *Bill*

New routines related to the calibration software being developed.

UVGET — Routine to select, calibrate, edit, etc., etc. data from a database (multi-source or normal) one visibility at a time.

CALCOP — Routine (to be used with UVGET) to copy, calibrate, edit, etc., etc. all data from one file to another.

Utility routines:

CSLGET — Reads/selects gain table entries.

CGASET — Interpolates gain table in time.

DATCAL — Applies calibration to record.

DATFLG — Applies flagging table to record.

DATGET — Read, calibrate, edit, transfer record.

DGGET — Converts data to appropriate Stokes' type.

DGHEAD — Prepares proper CATBLK for output of UVGET.

DGINIT — Sets up tables for DGGET.

GAININ — Smooths GAIN table and sets up for I/O.

INDXIN — Sets up to read INDEX table.

NXTFLG — Manages the internal flagging tables.

SELSMG — Does boxcar smoothing/blank replacement on selected calibrator gains.

SOUFIL — Looks up source numbers in the SOURCE table.

Also include files DSEL.INC and CSEL.INC.

Moved nowhere.

2362. *February 5, 1985* GSTROT *Larry Molnar/Bill*

Now returns times in degrees as advertised.

Moved nowhere.

2363. *February 5, 1985* GETCTL *Bill*

Now treats R and L pol. as I pol.

Moved to Modcomp this date.

2364. *February 6, 1985* MX *Pat*

The frequency axis of all files created by MX was incorrectly labelled. This was causing several problems in spectral line and bandwidth synthesis modes. In particular, fields well away from the phase reference position were having components subtracted with incorrect *uv* values for frequency channels away from the reference frequency. The only problem in continuum mode was the incorrect label for the frequency. This may have some impact on very accurate spectral index calculations. Note that to restart cleaning with an existing map made with previous versions of MX the map frequencies will need correcting with PUTHEAD.

The behaviour of MX when OUTSEQ = 0 has been changed. It now scans the beam and all maps it is creating to ensure that the sequence number it chooses is unique for all of them. Previously it was only scanning the beam file.

Moved to VLA this date, to 15APR85 (14-Feb), nowhere else.

2365. *February 6, 1985* MX *Bill*

Fixed problem with handling histogram maximum in MXRHIS. Changed (fixed?) handling of residual loading in MXMPAC. Fields with 1 residual are ignored.

Moved to 15APR85 (14-Feb), nowhere else.

2366. *February 7, 1985* UVSUB *Bill*

Made default model type component.

Moved to Modcomp this date.

2367. *February 7, 1985* ALGSUB *Bill*

DATAed the value for ZERO (=0).

Moved to Modcomp this date, to 15APR85 (14-Feb).

2368. *February 7, 1985* MX *Bill*
Removed branch into DO loop introduced in frequency fix-up.
Moved to 15APR85 (14-Feb), nowhere else.

2369. *February 10, 1985* VM *Tim*
I have attempted to fix the errors introduced by others in this splendid and noble program. I have removed typing changes but have retained "new improved TV routine." Also updated Help file to reflect possibility of higher gain values, *e.g.,* 0.3 seems to work well.
Moved to 15JAN85 at VLA, to 15APR85.

2370. *February 11, 1985* APIO *Bill/Kerry*
Made new variable IBIGNX declared I*2 and set equal to BIGNX. IBIGNX is sent to MINI3.
Moved these code changes to 15APR85 (14-Feb), nowhere else.

2371. *February 11, 1985* MX *Bill/Kerry*
In MXUNIF, JNYMIN was misspelled JYMIN; this may have caused some of the problems reported with uniform weighting.
Moved this change to 15APR85 (14-Feb), nowhere else.

2372. *February 11, 1985* UVMAP *Bill*
Added call to QWD in MAPOUT before call to QCRVMU. This cured a timing problem on the Modcomp.
Moved to Modcomp this date, to 15APR85 (14-Feb), nowhere else.

2373. *February 11, 1985* VM *Tim*
Reintroduced broken version of VM after fixing problem. A spurious variable BSCL had been introduced by someone "correcting" my typing. Might even work on the Modcomp; someone should move it there soon.
Moved to 15JAN85 at VLA VAXes, to 15APR85 (14-Feb), nowhere else.

2374. *February 12, 1985* PRTTP *Pat*
PRTTP was failing with integer overflow on large table files.
Moved to VLA, nowhere else.

2375. *February 12, 1985* MX.HLP *Pat*
Tidied up.
Moved to VLA, nowhere else.

2376. *February 12, 1985* UVMAP *Bill*
Removed I*4 from calls to MINI3.
Moved to 15APR85 (14-Feb), nowhere else.

2377. *February 12, 1985* PASS1 *Bill*
Changed I*4 in call to APXPOS (NCOL) to I*2.
Moved to 15APR85 (14-Feb), nowhere else.

2378. *February 12, 1985* VM *Tim*
I have added an option to estimate FLUX automatically. Set FLUX = 0.0 and unleash this awesome program. The option seems to work reasonably well in most cases, which means that it can be used quite often. Also changed Help file to reflect this change.
Moved to VLA, nowhere else.

2379. *February 13, 1985* POPS *Eric*
Revised PSEUDO and EDITOR to be more careful when building forward references for IF THEN ELSE structures. If the END for the structure was the last statement in a procedure (*i.e.,* no explicit RETURN was given), then the compiled code could lose track of where to go next even though FINISH now automatically adds a RETURN to the code.
Moved nowhere.

2380. *February 13, 1985* PRTCC *Eric*

Interactive tasks use LUN 5 for terminal communication with the user. That LUN is always assigned to the user terminal, while LUN 6 is the message terminal which may or may not be the user's terminal. Changed OUTLUN back to 5 for DOCRT TRUE — UNIX will have to learn how to deal with this or we will have to reserve yet another LUN and put it in all interactive tasks.
Moved nowhere.

2381. *February 13, 1985* MYVERS *Eric/Gary*

AIPS and BATER have to know the default version for activating tasks, finding Helps, etc. In the past, this parameter was set via DATA statements which had to be changed when the current program became the OLD version of itself. This was rarely done, in fact, so the OLD version had the wrong defaults. Changed the VAX procedures AIPS.COM and BATER.COM to set a logical to DEFVER (and removed block of OLD version). Also changed the Fortran as:

ZMYVER — (VAX) New: inquires setting of logical DEFVER and sets the VERNAM parameter accordingly.
ZMYVER — (MC4) Simply sets VERNAM to NEW: since the Modcomp supports only one version.
AIPS — Removed MYVERS parameters, added call to ZMYVER.
BATER — Removed MYVERS parameters, added call to ZMYVER.
BSTRT1 — Removed NEW version, added call to ZMYVER.

Moved these changes in AIPS, BATER, ZMYVER (VMS) to 15APR85 (14-Feb), nowhere else.

2382. *February 13, 1985* Scratch files *Eric/Gary*

Started a big change to make all scratch files be catalogued files. As a first step, created:
DFOL.INC CFOL.INC OLDDIE
As new names for the old files:
DFIL.INC CFIL.INC DIE
As the second step, created program DICONV in [...AIPS.ZPGM.VMS] which goes through all source code and changes the strings FIL.INC to FOL.INC and CALL DIE to CALL OLDDIE. Ran DICONV on all program areas. In APLSUB:, it changed:

BPROLL	IOSET1	IOSET2	IOSET3	IOSET4	IOSET5	MAPCR
MAPSNC	QROLL	SNCRC	TSKEND			

In NOTSUB:, it changed:

ALGSUB	API3	APIO	CALCOP	CCSGRD	DSKFFT	EMPTY1
EMPTY2	FFTIM	FILL1	FILL2	GRDCRM	GRDSET	INTMIO
ITBSRT	OTBSRT	PLEND	PLNGET	PLNPUT	SETGDS	SETUP
TABSRT	UVDOUT	UVDPAD	UVGET	UVMSUB	VISDFT	

In APLPGM:, it changed:

BLANK	BLSUM	CLIP	CNVRT	COMB	CORER	FITTP
FUDGE	PRTAB	PRTCC	TAFFY	TRANS	UVCOP	UVEXP
UVPLT	UVSRT	XBASL	XGAUS	XMOM	XPLOT	XSMTH
XSUM						

In NOTPGM:, it changed:

ASCOR	AVER	BCAL1	BCAL2	BLOAT	CANDY	CORMS
DBCON	DCONV	DESCM	FILLR	GAPLT	GNMRG	GNPLT
IMLOD	IMMOD	MWFLT	NINER	NNLSQ	PATGN	PFPL1
PFPL2	PFPL3	PLCUB	PLROW	QWKPL	RGBMP	SELSD
SLICE	STRIP	TASRT	UVAVG	UVDGP	UVERR	UVFIL
UVFIX	UVFLG	UVLOD	UVMOD	VBANT	VBCAL	VBCOR
VBMRG	VBPLT	VLBDR	XTRAN			

In APLAPG:, it changed APCLN and, in NOTAPG:, it changed:

APGS	APVC	ASCAL	BSCAL	CONVL	FFT	GRIDR
MX	REGLR	STEER	UVMAP	UVSUB	VBFIT	VM
VSCAL						

Moved nowhere.

2383. *February 13, 1985* Misc *Eric*

DICONV, in reading all Fortran files, pointed out numerous blank lines and excessively long lines. DICONV itself removed blank lines from

CALCOP ITBSRT BLANK XTRAN

while I removed blank lines from

SELSMG SGEFA QGRD2 MOMNT

and excessively long lines from

IMPFIT XTRAN

KONTR had too many long lines (all comments or numbered statements) to attempt a fix.

Moved nowhere.

2384. *February 13, 1985* Scratch files (2) *Eric*

The next step in the process is to create the routines needed to handle the new scratch files. So, did:

DFIL.INC — Added SCRCNO(20) and dropped SCRFIL(6,20) and MXSFDK(10).

CFIL.INC — Added SCRCNO, dropped SCRFIL and MXSFDK.

BLDSNM — New routine to make logical names for scratch files: Name = SCRATCH FILE, Class = task name including the *AIPS* number.

SCREAT — New scratch file creation routine: Uses BLDSNM to make name and contents of common /MAPHDR/ to make a header. Then loops through disks to find one with space for the file and room in the catalog. It starts with disk one higher than the one last used for scratch.

SCRNAM — Changed WaWa IO routine to name scratch files with BLDSNM.

DESCR — Changed to delete all the user's scratch files except for the tasks which are currently active. DESCR is called on ABORT and SCRDEST. Note: there is a new call sequence. New call sequence for ZTACTQ (PID not known).

AU1 — Changed to call DESCR on EXIT and RESTART.

AU2 — Changed to call new DESCR when GO known to fail (usually on DOWAIT TRUE or in batch) with a probable task abort and on ABORTASK.

AU3A — Changed to use new call sequence of DESCR.

CATLST — Changed to list SC files also when requested name or class is blank (mainly MCAT and UCAT).

SCRDEST — Changed Help file: TASK no longer used.

MCAT — Changed Help file: SC files will also appear in listing.

UCAT — Changed Help file: SC files will also appear in listing.

CATALOG — Changed Help file: SC files will also appear in listing if INNAME or INCLASS is blank.

Moved nowhere.

2385. *February 14, 1985* MX and Misc. *Eric*

Found some odds and ends while moving some of the above changes to 15APR85. Fixed:

CDBC.INC — Removed extraneous comment line.

CAPL.INC — Removed extraneous comment line.

MX — Corrected several errors in the tests which avoid duplicate names on output files. Primarily, changed to check all disks and all physical types and to use a correctly packed string for the class. Changed so that OUTSEQ = 0 means highest plus one as in all other *AIPS* tasks.

APCLN — Found an I*4 argument in a MINO call.

Moved nowhere (errors did not go to 15APR85).

2386. *February 13, 1985* Task Z routines *Eric*

UNIX implementations of ZTACTQ have been very slow since UNIX does not like task names; it prefers process ID numbers. In many cases, *AIPS* cannot know the "PID", but for calls to ZTACTQ which follow task activation directly the PID can be known. Accordingly, I changed the call sequence to ZACTV8 to allow an 8-byte PID to be returned and changed the call sequence to ZTACTQ to receive the PID. ZTACTQ must understand that PID(1) = 0 means that the PID is not known. In such cases, ZTACTQ is expected to use the task name alone to determine if the task is active and to return the PID so determined. Fixed these subroutines for the Modcomp and VAX versions to have no current use for this parameter.

Moved nowhere.

2387. *February 13, 1985* Task communication *Eric*

Our previous task communication depended upon the spawned task remembering, and being able, to resume AIPS (or AIPSC, BATER, or AIPSB) at an appropriate time. Realities being what they are, this method did not always work and AIPS or the batch queue was left hanging waiting for an event which never came. Also, on VAXes, it was possible for there to be a pending resumption signal which could not be suppressed and which caused the resumption to come too soon. I have changed the task communication method to have AIPS *et al.* suspend themselves on timers only and to determine periodically if the task has reset the return code in the task data file and/or disappeared. The method may cost a bit, but it is likely to be reliable and machine independent. The Z routines, ZTRSUM and ZSUSPN, may no longer be required. Also switched ZFI3 to ZFIO in all. Routines changed:

RELPOP — Dropped calls to ZTRSUM, switched to ZFIO, cleaned up, blocked return codes < -100.

AU2 — Dropped ZSUSPN, changed to wait for return code being set and/or initiated task disappearing. Increased list of AP tasks. Changed calls to ZACTV8 and ZTACTQ — PID will save time in several cases if ZTACTQ can also return it on task active conditions.

AUA — As AU2 for verb SUBMIT.

AUB — Changed only ZFI3 business.

BATER — Changed CUA to be like AUA.

BSTRT1 — Changed to use TD disk for resumption by AIPSB. Changed calls to ZACTV8 and ZTACTQ (PID known in 1 of 2 cases).

AIPSB — Changed to call RELPOP to resume (using the batch *AIPS* number location in the TD file) the initiator rather than calling ZTRSUM directly.

AIPSC — Changed to wait for AIPSB's resumption via the TD file. Increased list of AP tasks. New call sequences for ZACTV8 and ZTACTQ (PID known in one of two cases).

QINIT — In FPSSUB:, updated AP task list and changed call to ZTACTQ.

BPINIT — In FPSSUB:, changed as QINIT.

BPINIT — In [.FPS.SUB4K], changed as QINIT.

Moved nowhere.

2388. *February 14, 1985* LOGIN, AIPS *Gary*

Changed these VAX procedures to get rid of AIPSTR.COM. LOGIN.COM now calls AIPS.COM instead of AIPSTR. AIPS.COM was changed to set symbol DEFVER to OLD or NEW so that it could be read by ZMYVER.

Moved nowhere.

2389. *February 15, 1985* MX *Bill*

Fixed bug in MXUNIF introduced in AP interface upgrade. In loop 300, KTEMP set to IROW + 1.

Moved to 15APR85, this date.

2390. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

Prior to the last freeze of the *AIPS* source code, a massive effort was made to declare all items that were found to be undeclared in the standard code. A few more items were found to be undeclared, in particular, *AIPS* functions and the VMS intrinsics (blue ink) IAND, IEOR and IEOR. The non-standard code has been subjected to this process as well, at least in part (*i.e.*, there is no guarantee that all items are now declared in all of the *AIPS* source code). Most importantly, some items were found to be mis-declared either explicitly or by the default rules of Fortran (VMS is such a forgiving system). In addition, various funny, non-printing characters were removed from the beginning of some lines. The programs changed in AIPPGM were:

CATCHC — Inserted comma in declaration statement.

CATCHG — Declared function IWPC.

CATCHL — Declared function IFPC.

FILINI — Changed Z format specifier to I format specifier for terminal input (Z specifier not ANSI standard).

POPSGN — Declared function IFPC.

PRNTMN — Declared variable ISRCTY (formerly declared under the name ISCRTY).

Moved nowhere.

2391. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

The programs changed in APLAPG were:

APCLN — Declared undeclared local variables.

The programs changed in APLPGM were:

BLANK — Declared VMS intrinsic IOR.

BLSUM — Declared VMS intrinsic IOR.

EXFND — Eliminated funny character at beginning of two lines.

EXIND — Eliminated funny character at beginning of two lines.

FITTP — Declared TABWID as INTEGER*2 (was defaulting to REAL*4); declared RXCNT as REAL*4.

PRTTP — Eliminated funny character at beginning of one line.

TVPL — Declared function IWPC.

UVSRT — Changed INCLUDE from IHIS.INC to DHIS.INC in subroutine; inserted comma in declaration statement.

XGAUS — Declared FCN as EXTERNAL in subroutine XGALMS.

XPLOT — Declared JBUFSZ as INTEGER*2 (had been declared REAL*4, but is passed to a subroutine that expects INTEGER*2).

Moved nowhere.

2392. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

The routines changed in APLSUB were:

LMDER — Declared FCN as EXTERNAL.

LMSTR — Declared FCN as EXTERNAL.

PASS2 — WRK had been declared INTEGER*4 but was being passed to ZR8P4, ZMATH4 and MINS3 which, of course, expect pseudo I*4. Since this was the only way in which WRK was being used, it has been redeclared as pseudo I*4.

The routines changed in APLIIS were:

YCUCOR — Declared ISCRX and ISCRY.

YCURSE — Declared VMS intrinsic IAND.

YIMGIO — Declared VMS intrinsic IAND.

YISDRM — Declared dummy argument OP.

YISDSC — Declared dummy argument OP.

YISMPM — Declared dummy argument OP.

Moved nowhere.

2393. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

The programs changed in NOTAPG were:

ASCAL — Declared various local variables, dummy arguments and functions as well as eliminated funny characters at the beginning of some lines.

FFT — Declared various local variables and dummy arguments.

MX — Declared various local variables as well as INCLUDE'd DDCH.INC in subroutine MXSTAT to compliment CDCH.INC (? either necessary).

Moved nowhere.

2394. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

The subroutines changed by declaring various local variables in NOTSUB were:

AITOFF	ATFPNT	BOXSMO	CCSGRD	CLD	COINC	COMCLR
DAPM	DERF	DMAP	DTRC	EMPTY1	EMPTY2	ERF
FILL1	FILL2	FLAT	GETSTN	GNFSMO	GNSMO	GRDCRM
GRDSUB	IMOPEN	IMWIN	INTPFN	L1	LINIO	MADD
MCOPY	MFILL	NUT2	NUT4	PLNGET	QKSORT	SAVHDR
SET1VS	SPHFN	STRTIC	SUMARY	TBLIO	TVDISP	UVMDIV
UVMSUB	VISDFT					

Moved nowhere.

2395. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

Other routines changed in NOTSUB were:

ALGSUB — Declared various local variables including FCONJ which was defaulting to REAL*4 but is used as an array index.
CD — Removed funny characters from the beginning of several lines.
DSKFFT — Declared function IROUND.
PLEND — Misspelled variable in COMMON block.
PLGRY — Misspelled variable in COMMON block.
PLMAKE — Misspelled variable in COMMON block.
PLNPUT — Declared various local variables and function IROUND.
PLPOS — Misspelled variable in COMMON block.
PLVEC — Misspelled variable in COMMON block.
VISDFT — Declared various local variables.
XPOSE — Declared various local variables and removed funny characters from the beginning of several lines.
YCAMER — Declared various local variables and function IROUND.

Moved nowhere.

2396. *February 16, 1985* Undeclared/Mis-declared Items *Kerry*

The routines changed in SAPSUB were:

APGRD4 — Declared various local variables.
APINT — Declared various local variables.
APINTP — Decalred various local variables.
QVTRAN — Removed funny characters from the beginning of several lines.
VTRANS — Removed funny characters from the beginning of several lines.

Moved nowhere.

2397. *February 17, 1985* PFT *Don*

New HELP and RUN files added for the certification and benchmarking package. There is no task or verb. Instead, the inputs list is used in conjunction with TPUT and TGET to pass adverbs into SAVEd images of *POPS* procedures.

Moved nowhere.

2398. *February 17, 1985* TOVLB *John*

Added by Editors: Fixed MSGWRT blowup and increased parameters to pass out 18 stations.

Moved nowhere.

2399. *February 19, 1985* More PID *Eric*

I decided to enhance the meaning of PID in case some system wants to use the *AIPS* user number in the actual task name. The array PID now has user number in PID(1) and the process ID number in PID(2) through PID(4). PID(1) = 0 means any user number (in ZTACTQ calls). Changed BATER, AU2, AUA and DESCR to specify the login user and AIPSC, BSTRT1, BPINIT, and QINIT to specify any user. Changed the precursor remarks in both the VAX and Modcomp versions of ZTACTQ and ZACTV8 to reflect this change (although, so far, neither VAX nor Modcomp actually use the PID). Changed Modcomp version of ZSTRTA to have correct ZTACTQ call sequence.

Moved nowhere.

2400. *February 19, 1985* ZTKILL *Eric*

Changed the call sequence of ZTKILL to include the PID which, in the only occurence of ZTKILL to date, is made available by ZTACTQ. Changed AU2 to this new call sequence and changed both VAX and Modcomp versions of ZTKILL (precursor remarks only).

Moved nowhere.

2401. *February 19, 1985* NOBAT *Eric*

Changed it to test for the activity of the AIPS which started it. If that AIPS exits, then NOBAT will now exit. NOBAT is for users currently running an AIPS, not just for general obstreperousness.
Moved to VLA this date, nowhere else.

2402. *February 19, 1985* UVLOD *Kerry/Eric*

UVLOD was failing to compress its output files due to an error (it said CAT3(K3GCN) = F9 rather than F9 = CAT3(K3GCN) !).
Moved to 15APR85 and the VLA this date, nowhere else.

2403. *February 20, 1985* GRDSUB *Pat*

Under some circumstances GRDSUB was returning having done nothing at all! This was causing UVSUB to fail to divide data by an image.
Moved to VLA, nowhere else.

2404. *February 21, 1985* ZDOPRT *Pat*

The length of the string which the logical name PLOTTER expands to was extended. It was too short to use SYS$PRINT.
Moved to VLA, nowhere else.

2405. *February 21, 1985* COPY *Pat*

New task added to copy files. It will work with any type of *AIPS* file. It will copy from another disk, or user or remote VAX connected via DECNET and also running *AIPS*. Works for VAX VMS only.
Moved to VLA.

2406. *February 25, 1985* Installation Procedure *Gary*

Fixed up some things discovered by VLA and other sites.

- TRANSPRT — This procedure was sending directories I explicitly excluded. I worked around the problem by sending another save set.
- ILOAD — Used /EXCLUDE to exclude all directories, thus BACKUP will create the directories it needs but not load empty ones.
- ISHORTINS — Loads the three save sets (if needed) sent by TRANSPRT and excludes directories like ILOAD.
- IPROMPTL — Was not handling the case of no TV's correctly.
- ICOMPNS — Was not compiling non-standard FORTRAN Z routines.

Moved nowhere.

2407. *February 26, 1985* ASCOR *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared. In addition, the arrangement of variables in the COMMON block GAINIF resulted in alignment errors due to the positioning of LOGICALs at the end of the definition instead of sandwiching them between the last 4-byte items and the first of the items known to be 2-bytes in length (*i.e.*, INTEGER*2 variables). This allows LOGICALs to be either 4 bytes or 2 bytes without causing alignment errors on machines that care about such alignments. It was also discovered that an EQUIVALENCE statement contained an undeclared variable IFL which turned out to be superfluous [*i.e.*, EQUIVALENCE (GBUFF(264), IFL)] since IFL is not used anywhere else in the program. The same EQUIVALENCE occurs in ASCAL where the value of IFL is used to indicate the presence of a gain solution for each antenna IF (1 → just R, 2 → just L, 3 → both R and L).
Moved nowhere.

2408. *February 26, 1985* AVER *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared. Most notably, the the variable PRGM was not declared in the subroutine AVERIN where it serves as a dummy argument containing the task name. It has now been declared INTEGER*2 PRGM(3) rather than defaulting to a REAL*4 scalar.
Moved nowhere.

2409. *February 26, 1985* BLOAT *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared.
Moved nowhere.

2410. *February 26, 1985* CANDY *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared including the functions IFPC and IROUND.
Moved nowhere.

2411. *February 26, 1985* CCMOD *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared including the functions IROUND and SFACT. In addition, the variable NO was found to be uninitialized and being used as the second argument to TABIO.
Moved nowhere.

2412. *February 26, 1985* CORMS *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared including the function IFPC. Integer constant arguments to MSGWRT have been replaced by INTEGER*2 variables of the form N*n* which are appropriately initialized. Statement labels starting in column 1 have been shifted to start in column 2 per the *AIPS* coding standards. Unnecessary parentheses have been eliminated in ENCODE statement data lists which cause some compilers to interpret the grouping as a complex constant. Finally, the text files DMSG.INC and CMSG.INC have been INCLUDE'd in the subroutine COMBN which contains ENCODE statements using MSGTXT.
Moved nowhere.

2413. *February 26, 1985* DBCON *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared. Integer constant arguments to MSGWRT have been replaced by INTEGER*2 variables of the form N*n* which are appropriately initialized.
Moved nowhere.

2414. *February 26, 1985* DCONV, DESCM, EXPFIT *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared.
Moved nowhere.

2415. *February 26, 1985* EXPND *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared including the function IROUND and the variable BUFF which was being used in EQUIVALENCE statements and as an argument to subroutines expecting an array.
Moved nowhere.

2416. *February 26, 1985* PRTPL, ZDOPRT *Eric*
Removed the never-used parameter DESTRY from the call sequence to ZDOPRT and changed PRTPL to create its scratch file by the new standard method and to call DIE rather than DIETSK. Changed VAX and Modcomp versions of ZDOPRT. Also changed the special VAX versions ZDOPR2.MAR, ZDOPR3.FOR and ZDOPR4.FOR. Fixed CATLST to do the extra displays of SC files correctly.
Moved nowhere.

2417. *February 26, 1985* MDESTR *Eric*
Added by Editors: Changed messages.
Moved nowhere.

2418. *February 26, 1985* WaWa IO tasks *Eric*

To bring things back into line with the new scratch file creation standards, I have begun with the WaWa IO package. All of the routines below had *FOL.INC changed to *FIL.INC. In addition, I changed:

IOSET1 — Changed to set NSCR to 0, drop useless FILLs.
IOSET2 — Changed to set NSCR to 0, drop useless FILLs.
IOSET3 — Changed to set NSCR to 0, drop useless FILLs.
IOSET4 — Changed to set NSCR to 0, drop useless FILLs.
IOSET5 — Changed to set NSCR to 0, drop useless FILLs.
MAPCR — Changed to set NSCR, SCRVOL, SCRCNO when a scratch file is created. These could be used by DIE.
TSKEND — Changed to skip loop if NCFILE ≤ 0. (Left the clean up method unchanged since it assumes less programmer competence than does DIE.)

The task RGBMP had *FOL.INC changed to *FIL.INC. The tasks GEOM, IMFIT, IMLHS, LGEOM, MOMFT, PBCOR, PGEOM, RM, SUMIM and SUMSQ had the (required!) *FIL.INCs added to their root segments.
Moved nowhere.

2419. *February 27, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE and also made the following changes to:

MAPSNC — Changed to call SCREAT, requires new call sequence.
SCREAT — Changed to avoid the most recent catalogued file disk if there are no current scratch files.
BLANK — Removed unused BADDISK.
BLANK.HLP — Removed unused BADDISK.
DBLK.INC — Removed unused BADDISK.
CBLK.INC — Removed unused BADDISK.
BLSUM — Added real usage of BADDISK (it was present but not used).
BLSUM.HLP — Added BADDISK.
CNVRT — Removed excess buffer size and unused references to scratch files in the slice rescaling code.
COMB — Changed call sequence to MAPSNC.
CORMS — Changed call sequence to MAPSNC.
DCONV — Changed to init the file common (!), to use BADDISK, to do the new call sequence to MAPSNC.
DCONV.HLP — Added BADDISK.
IMLOD — Added BADDISK, changed call to MAPSNC.
IMLOD.HLP — Added BADDISK.
PRTPL — Added BADDISK.
PRTPL.HLP — Added BADDISK.
TAFFY — Removed unused BADDISK.
TAFFY.HLP — Removed unused BADDISK.
TRANS — Changed calls to MAPSNC, computation of scratch file size, and dropped SNCRB in favor of SCREAT.
UVSRT — Changed use of SNCRB to SCREAT which removed lots of pseudo I*4.
XBASL — Changed use of SNCRB to SCREAT, revised references to SCRFIL in PSCALE, switched to MAPSIZ from MAPSI3.
XGAUS — Like XBASL. Also dropped a scratch file delete which could no longer actually be executed.
XMOM — Like XBASL.
XSMTH — Dropped unused BADDISK.
XSMTH.HLP — Dropped unused BADDISK.
XSUM — Dropped unused BADDISK.
XSUM.HLP — Dropped unused BADDISK.

Moved nowhere.

2420. *February 27, 1985* DFIL Common *Eric*

Checked over programs and changed *FOL.INC to *FIL.INC and OLDDIE to DIE. Also changed ZCMPR3 to ZCMPRS as needed. Did:

CLIP	CORER	FITTP	FUDGE	PRTAB
PRTCC	UVCOP	UVEXP	UVPLT	XPLOT

Moved nowhere.

2421. *February 28, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE and also made the following changes to:

BCAL1 — Changed subroutine names, buffer allocations, modified typing style.

BCAL2 — Changed subroutine names, reordered declarations, modified typing style, changed ZCMPR3 to ZCMPRS.

BLOAT — Changed ZCMPR3 to ZCMPRS, cleaned out unused "user" history mess.

GAPLT — Tried to straighten this mess out — but it is really screwed up. Changed it to use the DFIL rather than just reference it by calling routines which depend on the values in DFIL. Changed it to update the header when each plot file is created and to do a proper delete on errors. Cleaned up the typing a little — it needs a lot of work. It has local (old) versions of CLAB1, CTICS and COORDD for subtle reasons which should be examined.

IMMOD — Removed unused BADDISK and SCALR1 (= SEED) adverbs and the "user" history card common.

IMMOD.HLP — Removed the unused BADDISK and SCALR1 adverbs.

MWFLT — Removed unused BADDISK adverb and the "user" history card common.

MWFLT.HLP — Removed unused BADDISK adverb.

NINER — Removed unused BADDISK adverb and the "user" history card common.

NINER.HLP — Removed unused BADDISK adverb.

NNLSQ — Removed unused BADDISK adverb and the "user" history card common.

NNLSQ.HLP — Removed unused BADDISK adverb.

PATGN — Removed unused "user" history card common.

Moved nowhere.

2422. *February 28, 1985* DFIL Common *Eric*

Checked over programs and changed *FOL.INC to *FIL.INC and OLDDIE to DIE. Also changed ZCMPR3 to ZCMPRS as needed. Did:

ASCOR	AVER	CANDY	DBCON	DESCM
FILLR	GNMRG	GNPLT		

Moved nowhere.

2423. *March 1, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE and also made the following changes to:

INTMIO — Cleaned up typing a bit.

SETUP — Revised typing a bit and added more comments. Moved from NOTSUB to APLSUB.

PLEND — Cleaned up typing, added comments.

CNVRT — Removed local copy of SETUP since that subroutine has moved to the APL area.

PFPL1 — Changed subroutine name START to PF1INI, cleaned up typing, corrected error setting the "depth". Added code after the INTMIO call to force the routine to work only over a single plane.

PFPL2 — Changed subroutine name START to PF2INI, cleaned up typing, corrected error setting the "depth".

PFPL3 — Changed subroutine name START to PF3INI, cleaned up typing.

PLCUB — It called DIE without ever initializing the common! Changed it to call SETUP and to use the DFIL common avoiding unneeded calls to MAPCLS. Added code to have it clean up on error. It lacked a lot of error testing which I added.

PLROW — Changed subroutine name START to PLRINI, cleaned up typing, corrected error setting the "depth".

SLICE — Removed local copies of VECWIN and INTMIO. Dropped the usage of the SL file as a "scratch" file for DIE (it can no longer work and it failed before to remove it from the header). Instead, added code to destroy the file and fix the header in both MAKSLI and SLTTWO. Renamed START to SLIINI.

Moved nowhere.

2424. *March 1, 1985* PRTACC *Eric*

Changed the format of the question about desired *POPS* numbers from I1 to I2. This reflects the use of hex for such things and should have been done a long time ago.

Moved to the VLA some time ago, nowhere else.

2425. *March 1, 1985* IMFIT *Fred*

The pathetic behavior of IMFIT was due, in large part, to the fact that the minimization routine was not being sent correctly computed partial derivatives of Gaussian models. Three of the six partials were computed wrong: the derivatives w.r.t. y-position, major axis length, and minor axis length. So, except in cases where these parameters were held fixed, the minimization routine did little but flop around. This evidently explains why it has always been necessary to do parameter "tweaking" after the fit.

The three necessary changes were made within the subroutine IMFMOD. In the case of a 12-parameter fit — two Gaussians, noiseless data, and a 41 × 41 data array — the exact parameters were obtained after this repair, in about 5 min. CPU time. The earlier, bad version of IMFIT would have taken in excess of 40 min. CPU time to produce the wrong answer for this test case (I didn't allow it to finish).

I noticed several other more minor problems: I don't like the way that errors are calculated, I don't see any need for the post-fit parameter tweaking, and I don't believe that the Gaussian-component position angle is handled properly, except for the standard orientation of the right ascension and declination axes. I'll try to work out remedies for these problems, and I may try out an alternative minimization algorithm as well.

Moved to 15APR85 and the VLA this date, nowhere else.

2426. *March 2, 1985* FILLR *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the functions IROUND and IFPC. Several local subroutine dummy arguments also required declaration. Changed calls to the intrinsic function IMOD to calls to its generic form MOD.

Moved nowhere.

2427. *March 2, 1985* GAL *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including several cases of local subroutine dummy arguments. Transformed some of the precursor program unit comments into something at least approaching the *AIPS* coding standard. Changed many instances where either comparisons or assignments were being made using CHARACTER constants into comparisons and assignments using appropriately DATA'ed INTEGER or REAL variables. Added call to CHCOPY to the function VCIR. Removed FNC from the calling sequence of PLFUNC and replaced references to FNC in PLFUNC with calls to the function VCIR since this is the only way in which PLFUNC is used. This should not be confused with the use of FCN (as opposed to FNC) elsewhere in the program. It was also necessary to change the order in which some statements appeared so that executables were not embedded in the declarations (*e.g.,* DATA statements followed by COMMON block definitions). Finally, the arrangement of items in the definition of the COMMON block labelled VELGAL required reordering to eliminate alignment errors.

Moved nowhere.

2428. *March 2, 1985* GAPLT *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including local subroutine dummy arguments.

Moved nowhere.

2429. *March 2, 1985* GEOM *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the function IFPC and dummy arguments to local subroutines.

Moved nowhere.

2430. *March 2, 1985* GNPLT *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including dummy arguments to local subroutines. It was also necessary to INCLUDE the text file DDCH.INC in the routine GNPLIN instead of IDCH.INC so that FTAB was declared. This program will still not compile under UTS or any other machine that cares about alignment on full word boundaries because of an EQUIVALENCE statement in the subroutine GAINPL that equivalences the REAL*4 variables TLAST and TFIRST with even numbered elements (250 and 252, respectively) of the INTEGER*2 array GBUF.

Moved nowhere.

2431. *March 2, 1985* IMLHS *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared.
Moved nowhere.

2432. *March 2, 1985* IMMOD *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the function IFPC and dummy arguments to local subroutines. Changed the function NOISE into a subroutine since this was how it was being used. Inserted comma in declaration statement to declare the variables BMIN and BPA. Changed typo in first argument in call to MAKOUT from NAEMIN to NAMEIN.
Moved nowhere.

2433. *March 2, 1985* IMPFIT *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared. Also fixed problem with filename truncation.
Moved nowhere.

2434. *March 2, 1985* IRING *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the function NBYPX.
Moved nowhere.

2435. *March 3, 1985* IMFIT *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the function IROUND and subroutine dummy arguments. Removed all expressions being passed as arguments to subroutines by replacing them with temporary variables that were instead assigned the value of the respective expressions. Replaced all integer constants being passed as arguments to subroutines with appropriately initialized INTEGER*2 variables with names of the form N*n*. Rearranged the COMMON blocks labelled IMFIO and IMFDA to eliminate common block alignment errors. Also changed IMFDA definition to be consistent throughout the program in terms of variable names. DATA was called B in the subroutine FCN. Changed all references to B in FCN to DATA. NPARM was called NCOUNT in several program units. Changed NCOUNT to NPARM wherever this ocurred and resolved conflicts wherever a variable already named NPARM was being used in another way. Changed calling sequence to the subroutine IMFOPN eliminating unused first argument. This argument was also called NPARM but had nothing to do with the NPARM in the COMMON block labelled IMFDA. In IMFDA, NPARM refers to the number of parameters being fitted. In the calling sequence of IMFOPN, NPARM referred to the number of program input parameters. Since IMFOPN made no use of NPARM but did contain the definition of IMFDA, eliminating NPARM as a dummy argument resolved the name conflict. Also changed the only call to IMFOPN to reflect the change in its calling sequence. As an aside, NPARM as an input argument was never assigned or intialized to anything anyway. Eliminated superfluous parentheses in ENCODE statement item lists. UTS complained about these as invalid complex constants. Changed precursor comments to program units as required. In particular, the comments in the main program describing the COMMON blocks labelled IMFIO and IMFDA. These were changed to reflect their new order. FBLANK was also added to the description of IMFDA as ????. DATA is compared to FBLANK in many places, however FBLANK is never assigned or initialized to anything. I suspect FBLANK is supposed to be initialized to 32768.0 (special blanking value for pixels) and this is probably why IMFIT often fails on images containing blanking. What a pain in the ass! IMFIT may actually work on the IBM now.
Moved nowhere.

2436. *March 3, 1985* MOMFT *Kerry*

During compilation on the IBM under UTS, several items were found to be undeclared including the function IROUND and subroutine dummy arguments. Replaced all integer constants being passed as arguments to subroutines with appropriately initialized INTEGER*2 variables with names of the form N*n*.
Moved nowhere.

2437. *March 3, 1985* MWFLT *Kerry*

During compilation on the IBM under UTS several illegal comparisons were detected involving the CHARACTER constants ALFA and NRML. Substituted REAL*4 variables initialized to these values in the problem statements.
Moved nowhere.

2438. *March 3, 1985* PATGN *Kerry*
During compilation on the IBM under UTS the functions IFPC and IROUND were found to be undeclared.
Moved nowhere.

2439. *March 3, 1985* Common Block Alignment Errors *Kerry*
During compilation on the IBM under UTS the the NOTPGM programs PFPL1, PFPL2, PFPL3 and PLROW all failed because of alignment errors in the COMMON blocks labelled MAPHDR, PLTCOM and PLTLAB. Defining COMMONs in descending order of item length eliminates such alignment errors. PLTCOM also appears in the NOTSUB routines PLEND, PLGRY, PLMAKE, PLPOS and PLVEC. MAPHDR also appears in PLMAKE. These routines were fixed much earlier (see entry 2140 in the 15OCT84 *AIPSLETTER*) but the programs that use them were not (oops!).
Moved nowhere.

2440. *March 3, 1985* QWKPL *Kerry*
During compilation on the IBM under UTS syntax errors were generated from IMPLICIT NONE statements left in this program. Removed them.
Moved nowhere.

2441. *March 3, 1985* REDIT *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared. Replaced all integer constants being passed as arguments to subroutines with appropriately initialized INTEGER*2 variables with names of the form N*n*.
Moved nowhere.

2442. *March 3, 1985* SELSD *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared.
Moved nowhere.

2443. *March 3, 1985* STRIP *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared. Replaced all integer constants being passed as arguments to subroutines with appropriately initialized INTEGER*2 variables with names of the form N*n*.
Moved nowhere.

2444. *March 3, 1985* SUMSQ *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared.
Moved nowhere.

2445. *March 3, 1985* UVFLG *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared including the function IROUND. Also found it necessary to include the text files DUVH.INC and CUVH.INC in the routine UVFGHS. Otherwise, the variable NVIS was undeclared, defaulting to INTEGER*2 and unvalued whereas it should have been declared INTEGER*4 and passed through common. Changed the declaration of the dummy argument N in the routine SKIPBL to plain INTEGER since it is used as an array dimension.
Moved nowhere.

2446. *March 3, 1985* UVLOD *Kerry*
During compilation on the IBM under UTS, several items were found to be undeclared. Eliminated call to ZR8P4 in UVHIS that formerly calculated XVIS based on a pseudo I*4 NVIS. These days NVIS is INTEGER*4 as passed via the COMMON labelled SCRINF in CUIN.INC.
Moved nowhere.

2447. *March 3, 1985* UVSEN *Kerry*
During compilation on the IBM under UTS, the function NBYPX was found to be undeclared.
Moved nowhere.

2448. *March 4, 1985* UVSRT, FSWTCH, MERGE *Eric*

The changes above caused big problems since MERGE was switching the disk, but not the catalog, numbers of the scratch files. This caused good catalog entries to be wiped out! Changed:

MERGE — New comments: point out that variables are in/out! New call sequence — receives scratch catalog numbers, not physical file names.

FSWTCH — New call sequence — switches catalog numbers as well as disk numbers, physical names and offsets.

UVSRT — Changed call sequence to MERGE.

Moved nowhere.

2449. *March 4, 1985* POLCO *Neil*

New task POLCO to correct total polarized intensity maps for Ricean bias. Also Help file.

Moved nowhere.

2450. *March 4, 1985* DFIL Common *Eric*

Checked over programs and changed *FOL.INC to *FIL.INC and OLDDIE to DIE. Also changed ZCMPR3 to ZCMPRS as needed. Did:

QWKPL	SELSD	STRIP	UVAVG	UVERR
UVFIL	UVFIX	UVFLG	UVLOD	

Moved nowhere.

2451. *March 4, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE and also made the following changes to:

UVDGP — Removed lots of excess adverbs.

UVDGP.HLP — Removed excess adverbs.

UVMOD — Removed excess variables from all over.

XTRAN — Changed bad GO TO statements, DATAing of common variables, and computations in format lists.

Moved nowhere.

2452. *March 4, 1985* TASRT *Eric*

Worked over this new task and its subroutines to update them for the new /CFILES/ common and to bring them closer to standard. Generally, I changed *FOL.INC to *FIL.INC and fixed the precursor comments to identify the input, in/out and output parameters more correctly. In addition, I changed:

TASRT — Changed to use SETUP, to compute the BUFSZ in a machine independent fashion, to use new TABSRT call sequence.

TABSRT — Changed to have a new call sequence with the size of the table buffer (was erroneously computed before), declared an I*4 variable, and changed call sequence to MERGE.

ITBSRT — Changed to create standard SC files with SCREAT and open them with correct new names.

OTBSRT — Changed to use ZCREAT rather than ZCREA3, to die on create error rather than update the header as if things were okay, and to build the needed scratch file name from the new common.

Moved nowhere.

2453. *March 5, 1985* APIO *Kerry*

Changed ZMATH4 argument (ONE) from true I*4 to properly initialized pseudo I*4 variable. An error only a word flipped machine like the VAX would miss. MX now works on the IBM (at least for CMETHOD = 'GRID') and will probably work on the Modcomp, Masscomp and Cray. A problem with CMETHOD = 'DFT' still exists that is probably due to a similar error in VISDFT or its dependencies.

Moved to 15APR85 this date.

2454. *March 5, 1985* POLCO *Neil*

Added extra adverb, PCUT, for blanking purposes. Made it tougher for the user to go home with an unblanked total polarized intensity map after running POLCO. Changed help file accordingly.

Moved nowhere.

2455. *March 5, 1985* IMFIT *Fred*

Kerry's change, mentioned above (entry 2432), wasn't the entire problem with blanking — the subroutine IMFDAT needed an additional correction. Also, there was a minor mistake in IMFPRT, involved with swapping FWHM initial guesses; this wouldn't generally have caused a problem. Also, there was a mistake in setting up the flags that indicate parameters that the minimization routine should hold fixed (this in subroutine IMFVST). I don't intend to patch up all of the problems that I find in IMFIT, because I'm writing a new task to replace it. However, these were easy to repair.

Moved nowhere.

2456. *March 6, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE, fixed ZCMPRS, and also made the following changes to:

VBCAL — Standardized typing a bunch — there's more to go.
VBCIT — For some reason this had not been changed to *FOL.INC, etc. Checked it over and fixed ZCMPRS.
VBCOR — Minor code standardization.
VBLIN — For some reason this had not been changed to *FOL.INC, etc. Checked it over and fixed ZCMPRS.
VBMRG — Minor code standardization — it needs work.
VBPLT — Changed handling of errors — all successful plots are saved and the last partial one. It will not leave trash files on disk or in the header anymore.
VLBDR — Corrected typing standards some — needs a lot.
HIOPEN — Made miscellaneous updates to typing standards.

Moved nowhere.

2457. *March 6, 1985* Plot routines *Eric*

Changed GINIT and GFINIS to use ZCREAT and ZCMPRS rather than the temporary (old) ones ZCREA3 and ZCMPR3. This gets rid of some of the old pseudo I*4 junk and some dependence on a single number for the number of sectors per disk granule.

Moved nowhere.

2458. *March 6, 1985* ZCMPRS, ZCREAT, NSPG *Eric*

Having made a good start on retrofitting the improved Z routines, I have tried to make it complete. These changes mean getting rid of some of that awful pseudo I*4 crap we tried to use for PDP 11s. Also changed ZFI3 to ZFIO a variety of places. Changed ZCMPR3 to ZCMPRS in:

PRTMSG TABIO

Changed ZCREA3 to ZCREAT in:

TABCOP	TABINI	EXTINI	FILCR	HICREA
AU2	SGLAST	SGLOCA	STORES	CONVRT
AIPSC	CATCHT	FILAI2	FILAIP	FILINI

Revised code referencing the disk-dependent parameter NSPG (sectors per granule) as if it were disk independent:

PRTMSG	TABINI	TABIO	EXTINI	FILCR	HICREA
AU2	AIPSC	CATCHT	FILAI2	FILAIP	FILINI

TABCOP's BUFF2 no longer returns the old CATBLK.

Moved nowhere.

2459. *March 7, 1985* New Task: JMFIT *Fred*

I've gutted IMFIT and re-written much of it to create a new task, JMFIT. JMFIT is usable now, so, even though I have in mind some more work to do on it, I'm releasing it for people to try. The minimization routine, DVDMIN, in the new task is based on an algorithm of W. C. Davidon. My coding of it (which also used to be used in the fitting programs on the IBM) is probably not superior to the Argonne Labs routine used in IMFIT; but on the other hand, DVDMIN is easier to use, and I've found it to be reliable.

Moved to the VLA.

2460. *March 8, 1985* UNIX Z-routines *Kerry*

As part of the port of the 15JAN85 version of *AIPS* to the IBM under UTS, the Z-routine changes that had occurred since the last port (15JUL84) were implemented for UNIX. Some of these routines are stubbed because they still require development under UNIX. In addition, some routines have undergone minor changes. The routines changed in [...APL.ZSUB.UNIX.GEN] were:

ZDM2DL.C — New routine (currently stubbed) used by FILLR only and requires development under UNIX.
ZMCACL.C — New routine (currently stubbed) used by FILLR only and requires development under UNIX.
ZQCRE3.C — Old pseudo I*4 version of ZQCREA.
ZQCREA.C — New true I*4 version.
ZQMSG.C — Removed register variable in subroutine call (not allowed in Berkeley UNIX).
ZR42CH.C — Changed first argument (nc) to I*4.
ZRDMF.C — New routine (currently stubbed) used by FILLR only and requires development under UNIX.
ZRM2RL.C — New routine (currently stubbed) used by FILLR only and requires development under UNIX.
ZCH2R4 — Changed first argument (NC) to accept either I*2 or I*4 on either word-flipped or non-word-flipped machines.
ZCLOSE — Changed to actually close LUN 5 (pre-connected under UNIX) since ZOPEN now actually opens it (after first closing it).
ZCMPR3 — Old pseudo I*4 version of ZCMPRS.
ZCMPRS — New true I*4 version.
ZCREA3 — Old pseudo I*4 version of ZCREAT.
ZCREAT — New true I*4 version.
ZDCHIN — Removed NWDPLI and NWDPLO declarations since these are now declared in DDCH.INC; changed ZFIO call to ZFI3 call.
ZDEACL — Un-commented out declarations since compiling with -u option complained about undeclared dummy arguments. This is still a stubbed routine that requires development under UNIX.
ZDEAOP — Un-commented out declarations since compiling with -u option complained about undeclared dummy arguments. This is still a stubbed routine that requires development under UNIX.
ZDEAXF — Un-commented out declarations since compiling with -u option complained about undeclared dummy arguments. This is still a stubbed routine that requires development under UNIX.
ZDIR — Fixed problem with building pathname to RUN files.
ZDOPR3 — Changed ZMIO call to ZMI3 call.
ZDOPR4 — changed ZMIO call to ZMI3 call.
ZDOPRT — Changed ZMIO call to ZMI3 call.
ZEXIS3 — Old pseudo I*4 version of ZEXIST.
ZEXIST — New true I*4 version.
ZFI3 — Old pseudo I*4 version of ZFIO.
ZFIO — New true I*4 version.
ZI32IL — Improved version as developed under VMS.
ZILI32 — New routine.
ZM70OP — Declared undeclared items.
ZM70XF — Declared undeclared items.
ZMI3 — Old pseudo I*4 version of ZMIO.
ZMIO — New true I*4 version.
ZMOUNT — Declared undeclared items.
ZMSGOP — Changed hard coded IOSUTS to IOSERR to match preprocessor inserted variable name.
ZOPEN — Formerly ZOPEN did not open LUN 5 since this is pre-connected under UNIX as read-only. Now it is first closed, then reopened according to the value of the shell variable TASKTTO (*i.e.*, the name of the input terminal) for read/write. This allows tasks like PRTCC, PRTUV, etc., to write to Unit 5.
ZPHOLD — Declared undeclared items (defunct routine).
ZQMSIO — New routine used to open a file for printing a plot on a QMS Lasergraphix device. This routine is stubbed and still needs development under UNIX.
ZTAPE — Declared undeclared items.

Moved to 15APR85 this date.

2461. *March 8, 1985* IMFIT *Fred*

There was another fairly serious error in the subroutine IMFMOD. The partial derivative of the model baseline with respect to the third baseline parameter, t, the "orientation of the slope," was computed incorrectly. The subexpression which ought to have been $y \cos t - x \sin t$ had, instead of t, the *sixth* baseline parameter ("orientation of major axis curvature") as the argument of the sine and cosine functions.
Moved to the VLA (15JAN85 areas) on March 9.

2462. *March 9, 1985* TOVLB *John*

In certain legitimate cases, the geocentric coordinates of a station entry in the ANtennas file may be exactly 0.0. For those cases TOVLB sets the geocentric x, y and z equal to 0.1 meters in the CIT output file.
Moved nowhere.

2463. *March 11, 1985* Gripes *Don/Eric*

A package of software to deal with gripes files has been stuck in AIPSUB (subroutines in GRISUB), AIPPGM (programs GRCHEK, GRSORT, GETTBC), and NEW (procedures GXTBC, GRTBC, GRCHANGE).
Moved nowhere.

2464. *March 12, 1985* ZQTRUN *Gary*

This routine was returning a final file size that was one block larger than the actual final file size.
Moved nowhere.

2465. *March 15, 1985* SAPSUB:QGRD1,2,3.FOR *Bill*

Fixed bug in table lookup of convolving function values; X and Y were reversed.
Moved to 15APR85 this date.

2466. *March 15, 1985* JMFIT *Fred*

A number of changes were incorporated, none of which actually affect the fitting: (1) The coding in the fitting routine DVDMIN was cleaned up a bit (*i.e.*, standardized some), and extensive comments were added to it. (2) A few comments were added elsewhere. (3) An old gripe inquired whether a printer plot of the final model could be generated by IMFIT. I added this feature to JMFIT (but not to IMFIT). (4) A call to ZCLOSE was added, to close the line printer file. (Kerry requested this change — under some operating systems it aids in spooling the output.) (5) The subroutine BMVAL, which sometimes is used to deconvolve a clean beam from the fitted Gaussian components, made an error, under certain circumstances, in swapping the major and minor axis lengths. (In attempting the swap, it used an uninitialized variable, MAX, where it ought to have used the variable MAJ, the major axis length). This change ought to be made in IMFIT as well. I renamed the variables MAJ and MIN, in order to avoid any potential confusion with the Fortran generic function MIN.
Moved to the VLA, nowhere else.

2467. *March 15, 1985* HICREA *Eric*

I fixed my earlier screwups — mainly to declare 2 variables as INTEGER*4, to get the correct change-status OPCODE for CATDIR, and to get rid of unused variables.
Moved nowhere.

2468. *March 15, 1985* PRTTP, QINIT *Eric*

Changed MAPSI3E to MAPSIZE in a FORMAT in PRTTP and changed a comment in QINIT.
Moved nowhere.

2469. *March 15, 1985* AU3A *Eric*

Changed ZEXIS3 to ZEXIST call.
Moved nowhere.

2470. *March 15, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and also made the following changes to the subroutines:

APROLL — Changed NWORDS in call sequence to true I*4. Changed from SNCRC to SCREAT. Changed to call Q routines and to delete the scratch file at the end with MAPCLR. (This automatic deletion was done by QROLL and BPROLL — the only routines to call APROLL — previously.) Added code to let NWORD $\leq$ 0 mean a simple release, delay and take.

BPROLL — Deleted this obsolete subroutine.

FSWTC3 — Changed call sequence adding catalog numbers.

QROLL — Changed call sequence to APROLL and removed the scratch file closing and destruction. Dropped NWORD $\leq$ 0 handling to let APROLL do it.

ALGSUB — Changed CHCOPY to ZPHFIL twice to get scratch names.

API3 — Changed CHCOPY to ZPHFIL to get scratch name.

APIO — Changed CHCOPY to ZPHFIL to get scratch name.

CALCOP — Changed CHCOPY to ZPHFIL to get scratch name, changed SNCRC to SCREAT, cleaned up ZCMPRS code, changed call sequence dropping SCTYPE since all scratch files are required to be SC.

CCSGRD — Fixed include names only.

DSKFFT — Changed CHCOPY to ZPHFIL 3 times to get scratch names.

EMPTY1 — Changed CHCOPY to ZPHFIL to get scratch name.

EMPTY2 — Changed CHCOPY to ZPHFIL to get scratch name.

FFTIM — Changed CHCOPY to ZPHFIL 3 times to get scratch names.

FILL1 — Changed CHCOPY to ZPHFIL to get scratch name.

FILL2 — Changed CHCOPY to ZPHFIL to get scratch name.

GAININ — Changed call sequence to TABSRT.

GRDCRM — Just changed the include names.

GRDSET — Changed SNCR, MAPSI3 to SCREAT, MAPSIZ. Corrected declaration and comments on BUFFER. Changed setting of scratch file type (all are SC now).

PLNGET — Call ZPHFIL to make scratch name.

PLNPUT — Call ZPHFIL to make scratch name.

SETGDS — Just changed the include names.

UVDOUT — Changed to call ZPHFIL twice to make scratch file names and corrected precursor remarks (no *input* scratch file is created).

UVDPAD — Changed to call SCREAT rather than SNCRC, to make scratch name with ZPHFIL. Changed call sequence to remove unused SCTYPE parameter since all scratch files are SC now.

UVGET — Changed call sequence to TABSRT.

UVMDIV — Changed call sequence to UVDPAD.

UVMSUB — Just changed the include names.

VISDFT — Changed to call SCREAT rather than SNCRC, to make scratch names 3 times with ZPHFIL. Changed order of two UVINIT calls (per Bill — it makes the routine work on the Nord and IBM for some unknown reason).

Moved nowhere.

2471. *March 15, 1985* GRDCRM, MX, APCLN *Pat/Eric*

GRDCRM was sometimes failing to grid clean components on the central declination row of a field. It was testing a real number against zero and relying on the rounding errors to give correct results. It sometimes failed resulting in CC's being completely ignored on this row. The problem was apparent in UVSUB but this same routine is used in ASCAL and MX (and other programs?) so the effects could be more widespread. The problem also arose in subroutines CMPCRM in APCLN and MXCCRM in MX.

Moved GRDCRM *only* from VLA this date, moved all to 15APR85 sometime, nowhere else.

2472. *March 15, 1985* Drop junk *Eric*

Some routines have become obsolete. Deleted, in APL areas, APROLL, BPROLL, MAPSI3, SNCR, SNCRB, SNCRC, OLDDIE, ZCMPR3 (VAX), ZCMPR3 (Modcomp), ZEXIS3 (Modcomp) and ZEXIS3.MAR (VAX). Deleted, in 3 FPS areas, BPINIT and, in INCS:, DFOL.INC and CFOL.INC. REBLD was moved to LOCAL — it isn't useful anymore.

Moved nowhere.

2473. *March 15, 1985* Scratch files *Eric*

Made the substitutions *FIL.INC for *FOL.INC and DIE for OLDDIE and also made the following changes to the tasks and their includes:

DCLN.INC	—	Added catalog numbers for scratch files.
CCLN.INC	—	Added catalog numbers for scratch files.
APCLN	—	Changed from SNCRB to SCREAT, changed call sequences to FSWTC3. Changed also to delete newly created images.
DGS.INC	—	Added catalog numbers for scratch files.
CGS.INC	—	Added catalog numbers for scratch files, reordered common for alignment.
APGS	—	Changed from SNCRB to SCREAT, changed call sequences to FSWTC3, changed BPINIT and BPRLSE to QINIT and QRLSE. Has not been converted to new AP interface otherwise. Changed also to delete newly created images.
DMAP.INC	—	Changed parameters.
CMAP.INC	—	Changed parameters.
APMAP.HLP	—	Added NPOINTS and BADDISK options.
APMAP	—	Added NPOINTS and BADDISK adverbs. Changed to use standard file commons, to use SCREAT, to call DIE one place only, etc. Made only the smallest stab at cleaning up the code — after which one might be able to find out why it doesn't always work.
DVC.INC	—	Added catalog numbers for scratch files.
CVC.INC	—	Added catalog numbers for scratch files, reordered common for alignment.
APVC	—	Changed from SNCRB to SCREAT, changed call sequences to FSWTC3, changed BPINIT and BPRLSE to QINIT and QRLSE. Has not been converted to new AP interface otherwise. Changed also to delete newly created images.
ASCAL	—	Changed to call ZPHFIL to name scratch file. Dropped NSPG parameter.
CONVL	—	Changed to use SCREAT rather than SNCRC and ZPHFIL to get the scratch file names.
FFT	—	Changed to use SCREAT rather than SNCRC and ZPHFIL to get the scratch file names. Corrected one BPINIT to QINIT (it had QINIT's call sequence).
GRIDR	—	Changed to use SCREAT, MAPSIZ and ZPHFIL for the scratch files.
MX	—	Changed to use SCREAT, MAPSIZ and ZPHFIL for the scratch files.
STEER	—	Changed from SNCRB to SCREAT, changed call sequences to FSWTC3, changed BPINIT and BPRLSE to QINIT and QRLSE. Has not been converted to new AP interface otherwise. Changed also to delete newly created images.
NTERP	—	Revised it to use the file includes, BADDISK, DIE and SCREAT. It now calls QINIT, but the rest is the old AP interface (and other junk).
NTERP.HLP	—	Added BADDISK.
UVDIS	—	Revised it a lot — mostly to check errors everywhere(!), to use the files common and DIE, to use SCREAT, and to stop calling DIECLN everywhere. Added BADDISK. Changed BPINIT to QINIT and APRLSE to QRLSE — the other AP things are still old.
UVDIS.HLP	—	Added BADDISK.
UVMAP	—	Changed it to use SCREAT, MAPSIZ and ZPHFIL with the scratch files. Cleaned up some of the typing.
UVSUB	—	Just changed the include names and DIE.
VBFIT	—	Changed calls to BPINIT, BPRLSE, BPROLL to the Q versions — there are old AP calls still present. Changed variable declarations in math package routines so that they might work on the Cray and UNIX. Used ZPHFIL to get scratch name.
VM	—	Changed to use MAPSIZ, SCREAT and ZPHFIL for the scratch files.
VSCAL	—	Changed to call ZPHFIL to name scratch file. Dropped NSPG parameter.

Moved nowhere.

2474. *March 15, 1985* Misc. *Eric*

Added by Editors: Deleted obsolete tasks (and helps) BSCAL and REGLR by moving them to LOCAL. Also changed TABIO to correct "possible error" and PATGN to fix include name from DFOL to DFIL.

Moved nowhere.

2475. *March 17, 1985* IMMOD *Neil*

An undeclared array (BADD in the subroutine IMMIN) caused an access violation error. This array is a remnant of the time when IMMOD had the adverb BADDISK and is not required. Deleted the offending lines. With this bug, the program would give an error message when linking and never run successfully. Where is the quality control?
Moved nowhere.

2476. *March 20, 1985* JMFIT *Fred*

The fixed format field used in IMFPRT to print the pixel separation, in units of arc seconds, was not wide enough for certain cases of single-dish data. So I changed two F8.4 field descriptors to F10.4. (IMFIT could use the same change, but I didn't change it.) It would be handy if the G-format specifier could be used in *AIPS*, and I wonder whether it's a part of the Fortran-77 standard. I also added some more comments to the subroutines FXDVD and DVDMIN.
Moved nowhere.

2477. *March 20, 1985* ASCAL *Pat*

The default solution interval was reduced in length. This should ensure that the default is one solution per integration.
Moved nowhere.

2478. *March 20, 1985* SPACE.COM *Pat*

A new version of SPACE.COM provides several new features. You can now specify ranges for disks and users. It will also select only inactive users. This new procedure replaces SPACES.COM and SPACED.COM.
Moved to VLA, nowhere else.

2479. *March 25, 1985* ALGSUB *Bill*

Fixed problem with 2048 and larger images. The routine will now reduce the size of the interpolation kernal if necessary to make the problem fit.
Moved to 15APR85 this date, nowhere else.

2480. *March 25, 1985* GRDSUB *Bill*

Fixed problem with multiple fields with separate input and output files. Input file to ALGSUB is now the output file for fields past the first.
Moved to 15APR85 and VLA this date.

2481. *March 26, 1985* PFT *Don*

Improvements were added to the PFTLOAD RUN file and an extensive explanation was added to PFT.HLP. The RUN files (PFTLOAD and PFTEXEC) now belong to user number 1, and thus are available to everyone. The procedures are "compiled" into SAVEd images by doing RUN PFTLOAD. They are then executed by doing RUN PFTEXEC after first setting the adverbs with INPUTS PFT followed by TPUT PFT. See EXPLAIN PFT for more details.
Moved nowhere.

2482. *March 28, 1985* AJAX *Eric*

Rewrote AJAX (the Fortran stand-alone program) to support the new, standard scratch files. It should be quite effective. Dropped the old AJAX procedure (on the VAX) and made a new one to run the AJAX program.
Moved nowhere.

2483. *March 28, 1985* CATCHA *Eric*

Created stand-alone program to read old catalog files and split them into CA directory files and CB image header files.
Moved nowhere.

2484. *March 28, 1985* Header files *Eric*

Changed the format of catalog files so that they contain solely the file directories. The header records will go in separate CB files. Anticipating possible future developments, the header file contains the current 256-word header in record 1 and, in record 2, all zeros except for word 1 which gives the file size in 256-word blocks. Changed from ZFI3 to ZFIO where needed. Changed:

CATDIR — Changed record numbers for directory, to make OPEN create and initialize the CB file, to make CLOS delete the CB file, and to expand the catalog when an OPEN is attempted and the directory is full. Also corrected it to prevent creating catalog files on search operations.

CATIO — Reordered steps to complete and close the directory file operations and then open and do the header operation.

CATOPN — Changed the requested file size for creating a catalog and the record numbers addressed when the directory is initialized.

CATCR — Changed the requested file size for creating a catalog and the record numbers addressed when the directory is initialized.

RENUMB — Changed to use revised directory record numbers, to open and read header file, and to rename header file. Corrected error in handling case in which an extension file of the new catalog number existed by accident.

CATLST — Changed record numbers in directory reading.

AU1 — Changed record numbers in directory reading.

AU3A — Changed record numbers in directory reading, to open a separate header file, and to destroy that file later.

AU7 — Changed record numbers in directory reading.

AU8 — Changed record numbers in directory reading.

DISKU — Changed to integer*4 counters to clean up displays. Changed record numbers in directory reading, to open separate header file, and to count the header file as an extension file.

FIXUSR — Changed record numbers in directory reading and to open separate header file.

RECAT — Changed record numbers in directory reading and to open separate header file.

Moved nowhere.

2485. *March 28, 1985* Passwords! *Eric*

There has been increasing concern about the security of the *AIPS* system and, since we are planning to add some very serious parameters to the SP file, we have decided to add an optional password system to *AIPS*. The (new) basic subroutines are:

PASWRD — Checks NLUSER's password and, if not blank, requires a password from the user.

PASENC — Encrypts the password — we need a better version here!

ZPRPAS — (VAX) Does the prompted read without echo.

And the routines changed to call it (and changed to ZFIO from ZFI3 as needed) were:

RDUSER — Added call to PASWRD - requires new call sequence.

AIPS — Changed call sequence to RDUSER.

BATER — Changed call sequence to RDUSER and made it pass the error back and die.

GRIPR — Changed call sequence to RDUSER and made it pass the error back and die.

GRITP — Changed to require Manager's password to init the file.

GRTOTEX — Changed to require Manager's password to init the file.

PRTACC — Changed to require Manager's password to init the file.

FILAIP — Changed to demand a password if the PW file exists and to create and initialize it if it does not.

FILAI2 — As FILAIP.

FILINI — Changed to demand a password if the PW file exists and to initialize it selectively if desired. Also removed all file size questions, replacing them with ZEXIST calls.

DELSG — Changed to require the Manager's password.

SETPAR — Changed to require password to change the parameters.

SETTVP — Changed to require password to change the parameters.

FIXCAT — Changed to require the Manager's password.

FIXFIL — Changed to require the Manager's password.

Moved nowhere.

2486. *March 28, 1985* PASSWORD *Eric*

Created the new verb PASSWORD by which the user may enter or change his password. Changed POPSDAT HLP to add the verb and AUC to implement the verb and created PASSWORD.HLP. Also changed the virgin default value for NPOINTS to 1 — which may reduce the gripes about UVLOD.
Moved nowhere.

2487. *March 28, 1985* System parameters *Eric*

Moved some basic system parameters from DATA statements in the code to the DDCH common. Also rearranged that common and its storage in the SP file. Changed are:

IDCH.INC — Added parameters NBITCH (number bits/character), TIMEDA(15) (TIMDEST limit 15 disks), TIMESG (TIMDEST limit on SAVE/GET), TIMEMS (messages), TIMESC (scratch), TIMECA (empty catalogs), TIMEBA(4) (limits on when a batch job can start), TIMEAP(3) (roll interval, delay parameters), RFILIT(14) (spare R*4 words). Dropped IFILIT.

DDCH.INC — As IDCH.INC.

CDCH.INC — As IDCH.INC. Rearranged to put all R*4's first.

SETPAR — Changed location of floating parameters and to pick them up via equivalence. Added lots of questions to display them and get local values.

FILAIP — Changed location of floating parameters and changed to pick them up via equivalence.

FILAI2 — Changed location of floating parameters and changed to pick them up via equivalence.

AU1 — Changed to get message delete interval from common.

AU2 — Dropped all tests for which tasks are AP and any time limits on starting a task.

AU3A — Changed to get TIMDEST limits from common rather than from a DATA. Also changed to allow a longer time for *AIPS* Manager data files on TIMDEST.

AIPSC — Changed to get AP start limits from common rather than from a DATA.

QINIT — (FPS version) Changed to get AP roll time and the parameters of the delay formula from common.

ZDCHIN — (VAX) Changed to set new parameters and to reset them by copying disk to local floating block.

ZDCHIN — (Modcomp) Changed to set new parameters and to reset them by copying disk to local floating block.

Moved nowhere.

2488. *March 28, 1985* TST Version *Eric*

We are going to a three-version setup with TST, NEW and OLD. There are routines inside *AIPS* which must handle such strings, so added TST to:

ZMYVER — (VAX) Added TST as an acceptable string.

VERMAT — Added standard strings TST and TSTPSAP and changed "FOUND IN VERSION=" message to appear whenever the default version does not match the first 3 characters of the version being used.

AU2 — Added TST: as one of the standard types to pass on GO.

AU2A — Added TST strings to TGINDEX, corrected error message on non-matching versions on TGET. Changed to ZFIO from ZFI3.

AUA — Added TST: as one of the standard types to pass on SUBMIT.

HELPS — Changed it to do min-match on RUN files.

AIPSC — Added TST: as one of the standard types to pass test of GO.

Moved nowhere.

2489. *March 28, 1985* Disk names *Eric*

We are going to separate data areas for TST and NEW/OLD. However, the public files, such as accounting and TV characteristics, must be shared. So, for the VAX, DAOO will now refer to [AIPS.DATA] on disk 1 and DAO*n* (n = 1 to NVOL) will refer either to [AIPS.DATA] or [AIPS.TDATA] on disks n. Changed ZPHFIL to set the correct DAO*n* and also simplified the coding of ZPHFIL and made it refer to the name as a packed R*4 character string. Changed ASSIGNL.COM, AIPS.COM, AJAX.COM, BATER.COM and GRIPE.COM to ask about TST also and to do appropriate assignments.
Moved nowhere.

2490. *March 28, 1985* String array adverbs *Eric*

Both GO and TGET were messing up the handling of character string adverbs when such adverbs were arrays. Although this case has arisen only in test code so far, I fixed AU2 and AU2A to handle the array case. Each separate string in the array is given a length of $(nchar + 3)/4$ reals in the task data file and is packed and blank filled.
Moved nowhere.

2491. *March 28, 1985* Help files *Eric*

Miscellaneous changes:

VERSION	—	Added TST and TSTPSAP and remarks about logical file names.
MCAT	—	Added remark that USERID applies only to public catalogs.
UCAT	—	Added remark that USERID applies only to public catalogs.
PCAT	—	Added remark that USERID applies only to public catalogs.
CATALOG	—	Added remark that USERID applies only to public catalogs.

Moved nowhere.

2492. *March 28, 1985* 32-bit tapes *Eric/Kesteven*

The new versions of ZI32IL and ZILI32 did not make it to the Modcomp Z routines. Copied the VAX ones since they should work on all 16-bit machines. IMLOD and UVLOD are not handling 32-bit tapes correctly at present. Corrections were given to Gary to be made along with his other additions.
Moved nowhere.

2493. *March 28, 1985* ZDCHIN, ZACTV8, ZACTV9 *Gary*

Eliminated an explicit SYS$INPUT when starting up tasks. ZDCHIN now sets up the input for tasks. ZACTV8 now tells the user when he starts up a Pseudo AP task.
Moved nowhere.

2494. *March 28, 1985* ZDIR, ZTOPEN, ZTXMAT *Gary*

Modified to work with minimum match for RUN files and to look for RUN files with the user number or user number 1, also to recognize TST.
Moved nowhere.

2495. *March 29, 1985* PASENC *Eric*

Added by Editors: A position-dependent, much more complicated password encoding scheme has been installed.
Moved nowhere.

2496. *March 29, 1985* POPSGN *Eric*

Allow setting VERNAM to TST, but program still assumes NEW.
Moved nowhere.

2497. *March 29, 1985* ZFREE *Gary*

ZFREE was not handling multi-volume disks correctly under some circumstances (the name string length was not getting updated). Also ZFREE would not do more than one logical name translation. This has been fixed.
Moved to 15APR85, nowhere else.

2498. *April 1, 1985* AU2A *Gary*

Still had some I*2's in ZFIO call for record number. Variable ONE was changed to LONE in several places.
Moved nowhere.

2499. *April 1, 1985* ZPHFIL *Gary*

Added MT files to list of 0 relative files.
Moved nowhere.

2500. *April 2, 1985* ZPRPAS *Gary*

Corrected a few bugs. Returning a carriage return in the password, not doing a line feed before printing, and not blanking buffer before printing.
Moved nowhere.

2501. *April 2, 1985* ZDCHIN *Gary*

Modified the new version so AIPS could be run from a subprocess.
Moved nowhere.

2502. *April 3, 1985* ERASE *Eric*

Corrected EDITOR to prohibit ERASE of line 1 — emits message suggesting that SCRATCH is what's desired. Corrected precursor comments in OERROR.
Moved nowhere.

2503. *April 3, 1985* GETNUM *Eric*

Due to VAX limitations on precision plus its habit of bombing on floating problems, we have to put a limit on the exponent in our number parser. I have raised the limit to -34 from the very conservative -28 previously used.
Moved nowhere.

2504. *April 3, 1985* CNTR, PCNTR *Eric*

Changed format in COMLAB to display the LEVS with a leading real (non-zero) digit.
Moved nowhere.

2505. *April 3, 1985* BADDISK *Eric*

Some of the WaWa tasks create scratch files but do not have BADDISK as a supported adverb. Changed this for GEOM, LGEOM, PGEOM, PBCOR, SUMIM, SUMSQ, and RM. Also changed the help files GEOM, LGEOM, PGEOM, PBCOR, SUMIM, SUMSQ and RM to add BADDISK. Changed PBCOR Help file to warn users that the program only works on simple RA-Dec planes, not cubes. Changed SUMSQ help file to use DPARM rather than the very significant XPARM.
Moved nowhere.

2506. *April 3, 1985* TVLABEL *Eric*

Modified the help file for TVLABEL to take TVWLABEL into account and created a help file for TVWLABEL which I forgot to do long ago.
Moved to 15APR85, nowhere else.

2507. *April 4, 1985* UVMDIV *Bill*

Variable XNCC was misspelled (XXNCC) in the test for a point model.
Moved to 15APR85, nowhere else.

2508. *April 4, 1985* GRIDR, GRIDR.HLP *Bill*

Added provision for uniform weighting, fixed to accept 2048 images and moved the calls to CONVFN to after the test for adequate AP memory.
Moved nowhere.

2509. *April 4, 1985* COMB *Eric*

Changed the default for APARM(2) on 'SUM ' to 1.0. Fixed up the help for this and removed some excess junk.
Moved nowhere.

2510. *April 4, 1985* POPS comments *Eric*

Changed GETFLD to make $ mean that all following text on the line is a comment. An * in column 1 is also used to indicate that the whole line is a comment.
Moved nowhere.

2511. *April 4, 1985* quote signs *Eric*

Changed STLTOU, the routine which forces characters inside quote (') signs to be upper case, to do its action only for paired quote signs. If the last open quote does not have a corresponding close quote in the line, then the string is not converted to upper case. Unclosed quotes around string data cause a syntax error so this has no impact on that use. However, for gripes, this change will reduce the number of times the text is arbitrarily converted to upper case.
Moved nowhere.

2512. *April 4, 1985* FREESPAC *Eric*

Changed this verb to use the adverb PRTLEV to determine whether the output goes solely to the terminal (PRTLEV < 1) or also to the message file at level 2 (PRTLEV ≥ 1). Changed AU3A (to pick up the adverb and send it to ZFREE), ZFREE (VAX and Modcomp, to new call sequence and to use the message level), and the help file for FREESPAC to be a proper verb help file with the new adverb. Also forced the messages to the message file when the AIPS program is in a RUN mode or in batch.
Moved nowhere.

2513. *April 4, 1985* WINDOW *Eric*

Added some more explanation to the "ILL WINDOW" message.
Moved nowhere.

2514. *April 4, 1985* Help files *Eric*

Minor fixes to the help files for:

CONVL	—	BLC and TRC description was reversed in inputs part.
SUBIM	—	Changed limits to allow XINC and YINC of 0.0.
TVMOVIE	—	Verb uses DOCIRCLE not DOCENTER.
CNTR	—	Added clarification about dominance of PLEV over CLEV.
PCNTR	—	Added clarification about dominance of PLEV over CLEV.
GREYS	—	Added clarification about dominance of PLEV over CLEV.

Moved the first 3 to 15APR85, nowhere else.

2515. *April 4, 1985* Plotting *Eric*

Earlier corrections to this version left GFINIS with a potential integer overflow in an intermediate result. Corrected the error.
Moved nowhere.

2516. *April 4, 1985* FILAIP *Bob/Eric*

Used the wrong format number for an error message.
Moved nowhere.

2517. *April 4, 1985* ABS, MAX, MIN *Eric*

Made these three functions verbs. ABS was a procedure, but should be quicker as a verb. MAX and MIN could be procedures for scalars, but as coded will work for arrays or scalars. Both MAX and MIN require two and only two arguments. Revised POPSDAT.HLP (to delete the ABS proc and add the verbs) and QUICK (to code the verbs) and created new help files for ABS, MAX and MIN.
Moved nowhere.

2518. *April 4, 1985* VBANT *John*

Modified the KEYIN subroutine which reads the T_{sys} and T_{ant} cards prepared by the user. Times expressed as XX:YY are now read as HH:MM instead of MM:SS. Also fixed a bug that caused VBANT to crash and burn when large time gaps were encountered in the T_{sys} cards. The source/system ratios provided by the Lister program for the phased-up VLA may be entered as T_{sys} cards. Use the new parameter INVERT after the TSYS keyword.
Moved nowhere.

2519. *April 4, 1985* EXTLIST *Eric*

Corrected AU8A for a format error on the "file contains garbage" message and for the test on slice files which erroneously caused the routine to branch to the offending message.
Moved to 15APR85 this date, nowhere else.

2520. *April 5, 1985* POPS *Eric*

Changed POLISH to allow continued parsing on some more pseudoverbs (STORE, SAVE, LIST and CORE) and to force the stack pointer to zero for the one-to-a-line pseudoverbs in case the user has typed something else on the input line. Changed STORES to use a local, rather than common, variable while doing LIST.
Moved nowhere.

2521. *April 5, 1985* Help files *Eric*

Made the following minor changes:

ASCAL	—	Changed all ' characters.
COMPRESS	—	Added remarks about its intention and the fact that even now when it is not implemented it must be the only command on the input line.
CORE	—	Added remarks on usage — it is allowed to occur with other statements on a line, but it will be executed ahead of all normal verbs.
EDIT	—	Added further remark re only statement on line.
ENDEDIT	—	Added remark re only statement on line and changed *RANCID* to AIPS!
ERASE	—	Added further remark re only statement on line and added the new limit prohibiting line 1.
GET	—	Added/changed remarks to point out that it must be the only command on the input line.
LIST	—	Added remarks on usage — it is allowed to occur with other statements on a line, but it will be executed ahead of all normal verbs.
MODIFY	—	Added further remark re only statement on line.
RESTORE	—	Added remarks to point out that it must be the only command on the input line.
RUN	—	Changed remarks re file names (.usr and 001 now used) and re the requirement that it be the only command on the input line.
SAVE	—	Changed remarks on usage — it is allowed to occur with other statements on a line, but it will be executed ahead of all normal verbs.
SCRATCH	—	Corrected this one from claiming that the "verb" was not implemented to describing how it may be used as the only command on the line to delete a procedure from the symbol table (although the core and text space is not recovered).
STORE	—	Added remarks on usage — it is allowed to occur with other statements on a line, but it will be executed ahead of all normal verbs.
UVSUB	—	Changed all ' characters.
VSCAL	—	Changed all ' characters.

Moved nowhere.

2522. *April 5, 1985* AIPMAN *Eric*

Generalized it to also put its output on the QMS printer. Had to change ZQMSIO (VAX) to have a third opcode for opening the QMS as a simple line printer. The character ' is used as the QMS control character — so it must not be used in help files, precursor comments and straight documentation text. Changed PRNTMN to allow TST version.
Moved nowhere.

2523. *April 5, 1985* IMLOD *Gary*

Putback a version with the new RENAME subroutine but the old everything else (I am still working on mods to the table routines) so that IMLOD will work from the TST area.
Moved nowhere.

2524. *April 5, 1985* ZDCHIN *Eric*

Brought the Modcomp version of ZDCHIN up to date.
Moved nowhere.

2525. *April 8, 1985* VISDFT, GRDSUB *Bill*

Added NGRDAT to precursor comments, added an AP timing call to VISDFT.
Moved to 15APR85 (VISDFT timing call only).

2526. *April 8, 1985* DSEL.INC, CSEL.INC, UVGET *Bill*

UVGET now saves the original frequency in the common /SELFAC/. This is the frequency corresponding to the u, v and w in the output data.
Moved nowhere.

2527. *April 8, 1985* JMFIT *Fred*

The subroutine IMFOUT prints out a summary of the final best-fit source model. Two sets of changes were added to IMFOUT: (1) Previously it did not print out the best-fit Gaussian component axis lengths in physical units (arcseconds), in the case of differing coordinate increments; I modified it to do so (and to treat the position angle appropriately).
(2) I added two calls, per Gaussian component, to XYVAL, in order to calculate the local pixel separations. (Three calls are required, but there was one already coded in.) Prior to printing out the axis lengths and the position angle, the subroutine now corrects these parameters according to the local pixel separation. This will have a negligible effect in most cases of VLA data, but it does matter for wide-field single-dish maps.
(3) Several very minor corrections were added to the help file.
Moved nowhere.

2528. *April 8, 1985* TASKS.HLP *Neil*

This important HELP file was woefully out of date and missing about half the available *AIPS* tasks so that I, amongst others, had no idea what was really available. Now I know. Updated it.
Moved nowhere.

2529. *April 9, 1985* CALCOP *Bill*

Fixed argument to SCREAT; ISIZE was misspelled SIZE.
Moved nowhere.

2530. *April 9, 1985* UVDOUT *Bill*

Fixed logic bug which caused the weights to be inversely proportional to the model amplitude.
Moved to 15APR85.

2531. *April 9, 1985* Gripes *Don*

A new service program to extract key strings from gripes and print lists in various sort orders has been saved in AIPPGM. It is called GRKEY.
Moved nowhere.

2532. *April 9, 1985* BSTRT1 *Gary*

Variable VERSON was not updated to the new length. I fixed it.
Moved to 15APR85, nowhere else.

2533. *April 10, 1985* GRIDR *Bill*

Declared UNFBOX as I*2 in routine SDGUNF. This was causing super uniform weighting to fail.
Moved nowhere.

2534. *April 10, 1985* Help files *Eric*

Changed PRTMSG to point out that INPUTS and all other verbs produce messages from AIPS, not some, possibly associated, task.
Moved nowhere.

2535. *April 10, 1985* TVINIT *Eric/Kestevan*

Changed the DeAnza version of YINIT to include "channel 16," which is used for graphics plane scrolls, in the initialization.
Moved nowhere.

2536. *April 10, 1985* MSGWRT *Eric*

Changed it to complain about the file size only after 750 messages and only every 21st message. Also, changed it to skip the complaint entirely for the *AIPS* Manager account. Reworded the message to avoid the implication that messages are being lost.
Moved nowhere.

2537. *April 10, 1985* TVFIND *Eric*

Changed to ignore zeroed images in setting the UNIQUE parameter which tells the calling program if there is more than one image of all types visible on the TV presently. Changed ZFI3 to ZFIO.
Moved nowhere.

2538. *April 10, 1985* ISCALE *Kesteven/Eric*

The scaling routine for TV intensities was reversing the input parms when the "max" was less than the "min." This was leading to incorrect images when the image scaling factor is negative. Changed the routine per Kesteven's suggestions.
Moved nowhere.

2539. *April 10, 1985* Gripes *Eric*

Added the strings \forget and \FORGET to the reading routine in GRIPE in order for a user to exit the gripe he has been typing without having it be recorded. Also created the new verb GRDROP to delete a specified gripe (iff it is by the login user, of course). Changed CHGRIP to test for the forget strings, AUC to handle the error code from CHGRIP and to do GRDROP, POPSDAT.HLP to create the new verb, and GRIPE.HLP to describe the forget strings and the use of GRDROP. Also created GRDROP.HLP. Changed GRIPR to match AUC including to handle the GRDROP verb and GRIPR.HLP to add GRDROP. Also switched CHGRIP from ZFI3 to ZFIO.
Moved nowhere.

2540. *April 10, 1985* PRTHI, adverbs *Eric*

Changed POPSDAT.HLP, DAPL.INC and CAPL.INC to add the adverbs PRSTART and OPTYPE and created new help files for them. Added the adverbs PRSTART and PRTASK to PRTHI in order to limit the display to records $\geq$ PRSTART which begin with the n non-blank characters in PRTASK. Changed AU7 and PRTHI to do this and created a new subroutine, CHBLNK, to find the first non-blank character in a packed string. Also changed AU7 to limit HI lines to 64 characters when DOCRT is TRUE.
Moved nowhere.

2541. *April 10, 1985* WaWa IO tasks *Eric*

Bugs in WaWa tasks:

- MAPCR — Changed to support BADDISK for scratch files and to select the disk following the rules of SCREAT. (SCREAT cannot be used because WaWa makes use of the catalog header it has created and assumes we have a map.)
- MCREAT — Fixed this one too — it was returning error 1 too often.
- FILNUM — (New) WaWa service routine to return the location in control buffer FILTAB of an open file.
- GEOM — Changed to use FILNUM rather than assume a location — which was wrong at least once and caused floating input files to get the new history rather than the output file.
- LGEOM — As GEOM.
- PGEOM — As GEOM.

Relink PBCOR, SUMIM, SUMSQ and RM.
Moved nowhere.

2542. *April 11, 1985* Gridding of *uv* data *Bill*

Revised the subroutines to do gridding and related operations. Gridding and uniform weighting routines were stripped out of MX and made into standalone routines. Several new routines were created, most notably MAKMAP, which has most of the functions of the task UVMAP plus bandwidth synthesis and editing and calibration capability. New routines:

MAKMAP — Makes images or beams in a variety of different modes. Can calibrate and/or flag data and create all necessary output and scratch files.
UVGRID — Grids a set of *uv* data with bandwidth synthesis capability.
UVUNIF — Does uniform weighting operation on a *uv* data set.
GRDCOR — Normalizes an image and applies the gridding convolution corrections.
IMCREA — Fills in the catalogue header and creates/catalogues an output file.
SETGRD — Creates scratch files for gridding routines.
D/CMPR.INC — Includes for common for linkage to gridding routines.

Modified program/subroutines:

GRDAT — Handles beam, sets default uniform weighting image size and scaling, sets default center pixel.
D/CGDS.INC — Added some info to this common used for the *uv* modeling routines.

Bug fixes:

CALCOP — No longer resets NVIS, corrected CHCOPY to ZPHFIL for getting scratch file names.
UVGET — Doesn't close index file if none exists.

Moved nowhere.

2543. *April 11, 1985* AIPLAS *Eric*

New service program to read the tape produced by PRNTMN and produce a manual with 2 logical pages per printed page in the smallest landscape font we have on the QMS. The program attempts to be machine independent, but is forced to the QMS laser printer currently. It is an attempt to get our standard manuals printed well in a more reasonable number of pieces of paper. Revised also ZQMSIO to open the QMS simple print file with extra width.

Moved nowhere.

2544. *April 12, 1985* WHATSNEW *Eric*

Deleted 15OCT84, renamed 15JAN85 to 15APR85, and added 27 entries for 15JUL85.

Moved nowhere.

2545. *April 12, 1985* VBANT, WSLOD *Eric*

Changed VBANT to call ZCMPRS rather than ZCMPR3. Changed WSLOD to use standard scratch file names, ZCREAT rather than ZCREA3, to close the task correctly (with DIETSK to handle all accounting, etc.), and to be a bit more standard in the typing. This will need a lot of work if it's ever to be standard.

Moved nowhere.

2546. *April 12, 1985* HELP TASKS *Don*

Removed ancient reference to GEOMA. The task list now mentions LGEOM and PGEOM, but does not contain the old task GEOM, even though it still lingers.

Moved nowhere.

2547. *April 14, 1985* ILOAD, ISHORTINS *Gary*

Added some warning messages and updated some error messages.

Moved nowhere.

2548. *April 15, 1985* DSKFFT *Bill*

Modified call sequence to pass buffers through call rather than through a common. This routine is called by UVMAP, FFT and MX. UVMAP and MX were suitably modified but FFT has been checked out by Moore for some time and was not modified.

Moved nowhere.

2549. *April 15, 1985* MX *Bill*

Numerous changes. Gridding and uniform weighting removed from MX and made standalone routines (see item 2542). The multiple CLEAN window option of APCLN was added for the first field. Also modified: DMX.INC, CMX.INC, MX.HLP.
Moved nowhere.

2550. *April 15, 1985* PRTGA *John*

Inserted the include statements DGAI.INC, CGAI.INC which define and common the GA file record variables. Since the order of variables in the common in CGAI.INC has changed recently, PRTGA will only read recently created GA extension files.
Moved nowhere.

2551. *April 15, 1985* ZMSGOP *Pat*

Since VMS version 4.0 there have been occasional problems with shared terminals returning "Device not ready" status and the offending tasks crashing. This is an attempt to fix the problem.
Moved to 15APR85, nowhere else.

2552. *April 16, 1985* Batch *Eric/Gary*

Batch does not receive process logical assignments and hence cannot work in the system we have created. The disk areas must be assigned differently for TST and OLD/NEW and the version of AIPSB and its default for the adverb VERSION must be that desired by the user. Note that we have never really had this right when there was > one version. Thus, changed:

- ASSIGNL — VAX command procedure now sets DA01, DA02, DA03 to ADISK1, ADISK2, ADISK3 to provide defaults for OLD/NEW.
- AIPSC — Starts QMNGR under *AIPS* number 2*NINTRN+2 rather than some version of AIPSB. Fixed minimum delay time, too.
- BSTRT1 — Starts QMNGR under *AIPS* number 2*NINTRN+2 rather than all versions of AIPSB.
- AIPSB — Changed to receive the job number and to run just one batch job before exiting. AIPSB will run as a subprocess to QMNGR.
- QMNGR — NEW: manages all the batch queues. Starts by marking as FAILed all "running" batch jobs which lack an executing AIPSB. Then looks for waiting job and starts the appropriate AIPSB. It repeats this in a loop until all AIPSBs have exited and no more jobs remain to be run.
- BATQ — Change format of queue file to keep a code (1,2,3 for OLD, NEW, TST, resp.) of the desired version. This limits us to 51 jobs rather than 64 at a time. Picks up VERNAM on OPEN for the file and sets VERNAM on FIND (which should be done only by QMNGR).
- AUB — Changed to 5 words per queue entry and display the requested version.
- GTPARM — Changed to set the priority to batch when NPOPS is that large except for AIPSB and QMNGR.
- FILINI — Changed to new format of queue file.
- ZPRIO — Moved from FPS area to APL (VAX and Modcomp).
- ZACTV8 — Changed reference of NPOPS to INPOPS in setting priority.
- ZACTV9 — Starts QMNGR rather than AIPSB as detached. On starting AIPSB as subprocess sets process logicals so that the disk names (DA0*n*) point to either ADISK*n* or TDISK*n* as needed for the given VERNAM.

Moved nowhere.

2553. *April 16, 1985* RDUSER *Eric*

Changed to limit the number of read errors to 10 before exiting. This removes the infinite loop when there is something wrong with the assignment of the input device.
Moved nowhere.

2554. *April 17, 1985* UVEXP *Gary*

This program could crash when GST at IAT=0 was over 360 degrees.
Fixed in NEW, moved nowhere else.

2555. *April 17, 1985* Miscellaneous *Eric*

Small changes:

DISKU — Changed it to continue on the given user when a CB file is missing. We'll get more information that way.

DESCR — Corrected arguments to an error ENCODE; they were in the wrong order.

MAPFIX — Changed limits for integer overflow test to avoid false indications due to use of SETBSC. Added call to SETBSC when a rescale is needed.

Moved nowhere.

2556. *April 17, 1985* TIMDEST *Eric*

Fixed AU3A on TIMDEST. It was referencing the user's catalog headers, not the headers belonging to the file to be destroyed!

Moved nowhere.

2557. *April 17, 1985* LGEOM *Eric*

Fixed a bug made in the round of fixes of 10-April: the scratch header was ending up in the output image header.

Moved nowhere.

2558. *April 18, 1985* PRTGA *John*

The COMMONs that set the GA record structure have been replaced with EQUIVALENCEs.

Moved nowhere.

2559. *April 18, 1985* TABHDR *Bill*

Corrected bug in cracking field format which caused an array to overflow.

Moved from Modcomp, to 15APR85, nowhere else.

2560. *April 18, 1985* VBFIT, VBCOR *Bill*

Now computes a pointer for the weights which was sometimes unset and sometimes incorrectly set. In general, VBFIT was doing the right thing (except for polarization data) and VBCOR was in general incorrect.

Moved from Modcomp, to 15APR85, nowhere else.

2561. *April 19, 1985* POPS K array *Bob/Eric*

COS has shown that some of the modifications made to hold a very large K array (*i.e.*, 32700 floatings) were not done in a machine independent fashion. Corrected are:

CCON.INC — Common should be K not C since K is longer when there is only 1 floating per integer.

INIT — Number of disk records MPAGE is set by the size of K not C. Change to ZFIO with appropriate I*4 variables so that the long K array may still be used.

POPSGN — Changed in a similar fashion to INIT.

Moved nowhere.

2562. *April 22, 1985* Disk assignments *Gary/Eric*

On the VAX, disk assignments may be passed to "spawned" subprocesses. However, spawn requires a DCL which is not available to a detached process such as QMNGR is required to be. Changes to overcome this are:

ZACTV9 — Starts tasks named QMNGR as detached process. Now starts all jobs at priority 4. QMNGR and AIPSB are started with no SYSOUT to prevent them from taking exclusive use of the message terminal. This is now set in ZDCHIN.

ZDCHIN — Sets up a SYS$OUTPUT for QMNGR and AIPSB.

ZSETUP — New Z routine to be called once the VERNAM, NPOPS and TSKNAM are known and in common. VAX version lowers priority for batch tasks and does disk assignments for TST: version programs.

ZSETUP — (MC4) lowers batch task priority, checks VERNAM.

GTPARM — Changed to call ZSETUP rather than doing the priority business I had put in a few days ago.

Moved nowhere.

2563. *April 22, 1985* BCAL1 *Craig*

BCAL1 now averages the input data set — preaveraging is no longer needed. The mean, rms, minimum and maximum of all of the data and of all data to each antenna are calculated and written to the output (VAX ASCII) file. An Explain file was written.
New version in TST: moved to VLA, nowhere else.

2564. *April 22, 1985* BCAL2 *Craig*

UNDO option was added and an Explain file was written. Program changed to protect against too large input files that used to cause abort.
New version in TST: moved to VLA, nowhere else.

2565. *April 23, 1985* SLICE *Pat*

SLICE was incorrectly dealing with blank pixels resulting in blank values being replaced by zero and also ringing around blank values. These problems should now be fixed.
Moved to VLA, nowhere else.

2566. *April 24, 1985* CATDIR *Eric*

Changed it to return error 1 (can't open catalog file) when CATOPN has a problem creating a new CA file. Routines like SCREAT and MCREAT are prepared to continue on that error return, but not on a 4 which was being passed directly back from CATOPN.
Moved nowhere.

Changes: 15-Apr-1985 version of *AIPS*

This section is intended normally to provide corrections and updates to the *AIPS COOKBOOK* in order to fill the gap between publication dates. There were no changes for the period 15-Jan-1985 to 15-Apr-1985 in the 15APR85 release which would impact the *COOKBOOK*.

AIPS Order Form

1. Name and address of Contact Person: _____

   ☐ Address label on back is correct _____

   _____

   _____

   _____

   (*N.B.*: If you have received a plastic mailing container from us, we insist that you use it for a reorder.)

2. ☐ new order ☐ reorder

   Version of *AIPS* currently running: _____

3. *AIPS* version desired: . . . . . ☐ 15-Apr-1985
   (Shipped 1 week after release date) ☐ 15-Jul-1985

4. Tape type desired:
   (VMS only) . . . . . ☐ VAX/VMS BACKUP
   VAX load modules desired: ☐ Yes ☐ No
   (requires 2nd 1600 bpi tape)
   (UNIX only) . . . . . ☐ UNIX tar
   Version of UNIX system in use: _____
   N.B. we need to know this. *e.g.*, bsd4.*x*, Sys III, Sys V, V7, *etc.*
   (Neither UNIX nor VMS) . . . . . ☐ Simple blocked card images
   ☐ FITS compressed text format
   Version of Z routines desired: ☐ VAX/VMS ☐ Modcomp ☐ UNIX

5. Tape density desired: . . . . . ☐ 800 bpi ☐ 1600 bpi ☐ 6250 bpi

6. There are gripes on (returned) tape: . . . ☐ Yes ☐ No

7. Printed documents requested: . . . . . ☐ 15JUL85 *COOKBOOK*
   ☐ 15JUL85 *GOING AIPS*
   ☐ *AIPS* Memo No. 33
   ☐ *AIPS* Memo No. 34
   ☐ *AIPS* Memo No. 35

Send order form to: *AIPS* Group
National Radio Astronomy Observatory
Edgemont Road
Charlottesville, VA 22901 USA

April 15, 1985

AIPSLETTER
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A I P S L E T T E R

Volume V, Number 3: July 15, 1985

National Radio Astronomy Observatory

A newsletter for users of the
*A*stronomical *I*mage *P*rocessing *S*ystem

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TEXset by EWG

News Notes

The NRAO has decided to discontinue the operation of the IBM 4341 in Charlottesville "not later than the end of 1985" and the ModComp may also be discontinued as an *AIPS* station in the not-too-distant future. A new computer is therefore needed for Charlottesville to replace the computational loads of these two machines and to relieve the severe overcrowding of the Charlottesville VAX. The Observatory is investigating what replacement system might best meet its needs. The *AIPS* group has been assisting in this investigation by talking to salesmen from a variety of manufacturers and, more importantly, by running the *AIPS* verification and benchmarking package on some machines. Results of these tests and information gleaned on other interesting computers are reported later in this *AIPSLETTER*.

One result of the testing has been the final verification of the *AIPS* port to the UNIX operating system. Beginning with the 15JUL85 release, the UNIX version will be considered a standard product and each new *AIPS* version will be tested on at least one UNIX system before it is released. The 15JUL85 was verified on the IBM UTS system and on the Green Bank MASSCOMP system prior to its release. A few details are reported in the Portability Column below. Since UNIX comes in a wide variety of "flavors," even with versions having the same identifier (*e.g.,* 4.2bsd), our UNIX version will probably always require a small amount of local work at each site. The areas which may cause such problems are clearly identified in the installation instructions. All UNIX sites which have an earlier release should probably order the 15JUL85 release of *AIPS*.

The 15JUL85 release has also been ported to the Cray X-MP at Vector Production in Los Angeles. Most of the dozen tasks in the verification and benchmarking package (see 15 April *AIPSLETTER*) appear to work with only minor problems remaining. The agreement in the answers is, in some cases, not good enough, and these programs will be studied in more detail. During the coming quarter, a full verification will be run on the unvectorized code and then vectorization instructions and modifications to the algorithms in the "Q" routines will be added and verified. Some non-programmer use of *AIPS* on the Cray should then become possible.

Summary of Changes: 15 April 1985 — 15 July 1985

These changes are listed in detail in the CHANGE.DOC files reproduced later in the *AIPSLETTER*. This section of the *AIPSLETTER* will have a new format henceforth. It will be divided into four parts, two for users and two for programmers, two for changes in the version now being released to non-NRAO sites and two for changes in the version now being released to visitors at NRAO sites.

In this quarter, we have concentrated more on long-term projects than on easier, smaller improvements. Nonetheless, there are 23 changes to 15JUL85 as NEW and 105 changes to 15OCT85 as TST listed in the CHANGE.DOC files. Our studies of vectorization have led to improved algorithms for some of the virtual-AP ("Q") routines. The algorithms are receiving further study, however, before being released. Much planning and some coding have been invested in a new directory structure which we intend to implement in 15JAN86 along with shared load modules (for VAXes). Spurred by the Cray project, a package of Y and control routines is being developed to do TV display between cooperating processes, including ones on different computers.

Changes of Interest to Users: 15JUL85 as NEW

A correction was made for VAXes to try to prevent tasks from aborting when the main AIPS is aborted with a CTRL Y. Considerable work was done in 15OCT85 on the display and map combination tasks. Serious bugs found in this project — including the display and history operations of CORMS and the REDO options of BLANK and BLSUM — were corrected in 15JUL85. Bugs in EXTDEST and in finding the weights for gridding by MX were also corrected.

Changes of Interest to Users: 15OCT85 as TST

Two new tasks have appeared in 15OCT85. UVFIT fits gaussian or uniform, optically-thin spherical models to small *uv* data sets. HGEOM will regrid one image in the geometry of another image. This is an important task for comparing and combining images, particularly images taken with different instruments. PGEOM acquired several new capabilities including deprojecting rotated elliptical or spiral objects. The code in MWFLT and PATGN has also become more "robust." The convergence tests in ASCAL have been made more stringent in order to support higher dynamic ranges. The CLEAN algorithm was revised substantially. Heretofore, accuracy was lost on most pseudo-AP versions and whenever the data were rolled on true-AP versions. The revised algorithm loads fewer image points to the AP, but gets the right answers (see entry 2627 for details).

The display and image combination areas received most of the changes which will be visible to users. The DOALIGN adverb, used by BLANK, BLSUM, COMB, CORMS, GREYS, and PCNTR, has an extended, uniform interpretation: 1 means full alignment, 0 means alignment by BLC coordinate value, -1 means alignment by offset from the reference pixel, and -2 means alignment by pixel number (see 2595 and 2665 for details). All six tasks select just the subimages which overlap fully under control of DOALIGN after application of BLC and TRC to the first input image. The option DOINVERS is now in all blotch routines — BLANK, BLSUM, TVSTAT, and IMSTAT — to specify that their operations be performed outside the selected regions rather than inside. All tasks which produce plot files add a line both to the history file and to the plot giving the plot file version number and creation time. (The plot line may be suppressed by setting LTYPE negative.) The adverb INTYPE was dropped from these tasks. As a result, EXTLIST will regard old plot files as defective although TKPL *et al.* should be able to display them. EXTLIST also supports several more plot-file types.

As these general improvements were made to the individual tasks, special task-specific changes were also made. COMB and CORMS both interpret the adverbs in physical units, supply no defaults for clipping, and regard magic-value blanking as normal (*i.e.*, the meaning of APARM(8) is reversed). COMB has revised

algorithms for the CLIP, REAL, and IMAG operations. CORMS was corrected to tell the truth about blanking, to use BADDISK, to interpret "logical" adverbs in consistent, mostly *AIPS*-standard ways, to allow S/N blanking of optical-depth and spectral-index images, and to blank noise maps in the same ways as result maps. PCNTR now expects adverbs ICUT, PCUT, and FACTOR to be in physical units. GREYS can add an optional step wedge to its display and allows the selection of a different plane in a cube for the contour image. UVPLT offers, as an additional axis type, IAT expressed in sexagesimal hours. The meanings of XINC and YINC have been reversed in PROFL and standard printer routines (with the DOCRT option) are used in BLSUM. The tasks PLCUB and PLROW have become useful after correction and enhancement. PLCUB supports XINC, YINC and PIXRANGE options with standard labeling and usable, multiple plot files. PLROW uses OFFSET in physical units to give the intensity scaling only (row separation is handled automatically) and a hidden-line algorithm prevents the plot from being too cluttered. VBPLT was cleaned up and corrected extensively. It allows IAT in hours as an axis type, handles separate scaling for each subplot if requested, and correctly computes and plots clean-component, gaussian, and uniform-sphere models. PRTGA and GAPLT were corrected and displays of VBANT T_{sys} and T_{ant} files were added. The inputs to, and outputs from, GAPLT were also corrected, revised and improved.

Changes of Interest to Programmers: 15JUL85 as NEW

A variety of corrections were made in 15JUL85 for portability reasons. These included several small items found by the Cray and a major push for requiring variable declarations and the like. A bug in the I^2S Model 75 version of the cursor control routine was corrected (see entry 2584). The worst bugs in the plot paraform tasks, PFPL*n*, were corrected, but programmers are encouraged to use the 15OCT85 versions.

Changes of Interest to Programmers: 15OCT85 as TST

All corrections made in NEW were also made in TST. In *POPS*, all strings are now given the same storage lengths on all machines; this means that DAPL.INC is no longer machine dependent (see entry 2594). The default *AIPS* Manager password has been reduced to 8 real characters to assist UNIX implementations (see 2671). For transportability and standards reasons, we have begun to enforce the declaration of all variables (see 2670) and have corrected numerous bugs as a result (see 2677–2681, 2691, etc.). On VAXes, all MACRO routines must be in position-independent code (see 2646). A potential recursion was removed by creating message-file versions of the file expansion Z routines (see 2663). Quite a bit of work was done in the display area. The basic routines were enhanced, including a new call sequence for CTICS and a more complex version of CLAB1 called CLAB2 (see 2650 and 2659). The plot paraforms PFPL*n* and their utility subroutines were corrected and enhanced (see 2640 and 2642). A new parameter, NCHPRT, was added to the device common to specify the width of the local line printer (see 2597). At present, however, very few tasks have been enhanced to use this parameter, but an addition to ZDCHIN is already required. In the TV area, the DeAnza version of YIMGIO was corrected (see 2661) and a complete set of Y routines for sites with no TV was developed (see 2672). In anticipation of remote TV displays, the image catalog routines ICINIT, ICREAD, ICWRIT, *et al.* have been revised into generic Y routines (see 2688–2690).

The Portability Column

CPU/OS Combinations

Digital Equipment Corporation VAX-8600+VMS: AIPS was installed on a VAX-8600 at DEC's Large Systems Center on 29 April and the verification and benchmarking package (see previous *AIPSLETTER*) was run. A complete report is available as *AIPS* Memo No. 36. The installation was completely nominal; the load modules from the Charlottesville VAX-11/780 were simply read from tape and executed. The images computed by the 8600 matched those computed by the 780 exactly, thereby verifying the 8600 as an *AIPS* machine. The table below gives the ratio of 780 to 8600 real times (both in pseudo-AP mode) for portions of the PFT test. For comparison and additional information, the ratios of real times on a 780 to those on a 780 with AP, IBM 4341 under UTS without AP, MASSCOMP without AP, and ModComp with AP are also given. The times for the ModComp do not include VM.

Task	780 / 8600	780 / 780+AP	780 / IBM 4341	780 / MASSCOMP	780 / ModComp+AP
full PFT test	3.8	8.8	0.73	0.85	5.8
PFT *POPS* compile	2.3	1.0	3.50	3.08	0.48
UVLOD	3.1	1.0	1.40	??	0.74
COMB	2.4	1.0	0.95	0.62	0.78
UVSRT	1.5	1.0	0.66	0.40	0.56
UVMAP	2.9	2.1	0.71	0.49	1.6
APCLN	4.8	13.5	0.90	0.80	13.7
ASCAL	3.2	22.8	0.50	1.13	19.6
MX - cleaning	4.3	14.1	0.76	0.84	13.5
SUBIM	1.1	1.0	1.20	1.00	0.52

Thus, compute-bound tasks run up to 4.8 times faster on an 8600 than they do on a 780, consistent with DEC's advertisements. I/O-bound tasks show little gain in speed over the 780, presumably because the I/O system is not all that much faster, particularly when the disk drives are the same. All we can do, at this time, is speculate about the performance of an 8600 with an FPS array processor. The faster CPU will allow the AP driver and the host-CPU code to execute faster, but the I/O itself would be about the same. The current range of opinion is that an 8600 with AP would be 1–2 times faster in real time than a 780 with AP. Digital Equipment Corporation may be contacted at 617–897–5111. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it except for the fact that AIPS will run on it.*

Convex Computer Corporation C-1+UNIX: The CONVEX C-1 is a computer which was previously reviewed in the 15JAN85 *AIPSLETTER*. It is a vector register machine analogous to the Cray with 8 vector registers, each 128 words long. Counting only floating-point operations, the maximum speed of the C-1 is 40 MFlops for 32-bit floating data and 20 MFlops for 64-bit data. The CPU-to-memory bandwidth is 80 MB/sec and the I/O system has a concurrent bandwidth to memory of 80 MB/sec. The scalar and vector units support all "normal" integer and floating types and 64-bit real numbers have an extended exponent which allows numbers up to $10^{\pm 300}$. The operating system is UNIX 4.2 with all the standard networking protocols. The Fortran compiler supports most VMS extensions to Fortran-77 and is one of the most sophisticated vectorizing compilers currently available.

AIPS was installed on a C-1 at Convex's marketing department in Richardson, Texas beginning on 30 May and the verification and benchmarking package (described in the 15APR85 *AIPSLETTER*) was run. A complete report is available as *AIPS* Memo No. 37. The installation was a standard UNIX port with the usual, minimal local setup requirements. The compiler, with only local optimization allowed, was found to have only one serious bug — computed GO TOs worked only with INTEGER*4 branch counts (Convex has since

fixed this bug). After only 48 hours on the machine, *AIPS* was up and running and five of the PFT tasks had passed the verification tests. The next three weeks were used to track down remaining bugs and to test and improve the vectorization of the pseudo array processor routines. Because of the many "ifs", "ands", and "buts" which must accompany any table of performance numbers for radically different architectures, we refer the reader to *AIPS* Memo No. 37 for all the details. For highly vectorized code, such as MX (cleaning), the C-1 outperformed the 780+AP by about a factor of 3. On unvectorized tasks, the C-1 seemed to run about 60% as fast as the 8600 in CPU time and 85% in real time. Expected improvements in I/O system software should make the C-1 equal to, or only slightly slower than, the 8600 in purely scalar computations. Certain tests, such as compiling the PFT *POPS* procedures, are dominated by system calls for file opening and miscellaneous I/O. The C-1 appeared to be 1.7 times faster than the 8600 for such operations, and that number should probably be increased to correct for the 1200-baud line used to obtain it. Prices for C-1 systems range upward from about $500K. Convex Computer Corporation may be contacted at 214–669–3700. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it except for the fact that AIPS will run on it.*

MASSCOMP MC-500+UNIX: The 15JUL85 *AIPS* has been installed on the MASSCOMP at Green Bank and the system has fully passed the PFT test; performance results are tabulated above. In general, the MC-500 lives up to its claim of being between a VAX-750 and 780 in speed. The ASCAL results in particular suggest that the sine and cosine functions are unusually fast on the MC-500.

IBM 4341/VM+UTS: The 15JUL85 *AIPS* has been installed on the IBM 4341 in Charlottesville and the system has fully passed the PFT test; performance results are tabulated above. In general, the 4341 appears to be slightly slower than the 780; this may reflect compiler technology more than hardware capabilities. The hexadecimal normalization used in IBM floating point hardware appears to degrade the precision of computed results by the expected amount.

ModComp Classic/AP-120B+MAXIV: A recent execution of the PFT test on this system in Charlottesville showed that almost all functions performed correctly; the most notable exception was the task VM. Performance results are also tabulated above. In general, the ModComp is significantly slower than the VAX-780 for scalar computing, particularly when the ModComp must use heavily overlayed code, but, for array processor operations, the two machines are about the same.

Generic UNIX Kits: The 15JUL85 release for UNIX systems contains numerous improvements and corrections over those releases previously sent to UNIX sites. All such sites are encouraged to request the 15JUL85 release.

Product Reviews

Alliant Computer Systems Corp. FX/8+UNIX: On July 23, Alliant announced a new line of computers containing from 1 to 8 "computational elements" (CEs), *each* of which is both a scalar and vector computer reportedly approximately equal in power to a VAX 8600 plus AP-120B array processor. An FX/8 system with 8 CEs is said to have a peak performance rating for 32-bit data of about 35 Mips for scalar operations and 94 MFlops for vector operations. The company claims to have a Fortran compiler which automatically vectorizes the code and spreads the load out over as many CEs as are available for concurrent operation. If true, this appears to be a major breakthrough in compiler technology. The *AIPS* group already has the code on disk in Acton, MA and will begin the PFT tests soon. We will report the results in the next *AIPSLETTER*. Alliant Computer Systems Corp. may be contacted at (617) 263-9110 in Acton, MA. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it.*

Harris Corporation HCX-7+UNIX: On June 3, Harris announced a new 32-bit, UNIX-based computer called the HCX-7. It is rated, according to the company, at over 7 Mips, about 1.75× the VAX-8600. The operating system is AT&T UNIX System V with Berkeley 4.2 extensions; it supports the standard TCP/IP protocols on

Ethernet. The 32-bit virtual memory architecture and instruction set of the HCX-7 were specifically designed to execute operating system and high-level language functions efficiently. The memory bus bandwidth is 40 MB/sec; the I/O system currently uses Versabus, with 11 MB/sec bandwidth.

On the surface the HCX-7 appears to be a good candidate for *AIPS* implementations, and, at prices ranging upward from about $225K, it appears to be priced quite competitively. Currently Harris does not offer an array processor option; for this reason, NRAO is not pursuing *AIPS* tests on the HCX-7. (Note: in addition to its HCX-7, Harris is also marketing MASSCOMP workstations under the Harris name.) Harris Corporation may be contacted at (305) 974-1700 in Fort Lauderdale, FL. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it.*

AIPS Workshop

As mentioned in the last *AIPSLETTER*, we plan to hold an *AIPS* Workshop immediately after the next NRAO Users' Meeting in Charlottesville. Due to a change in the date of the Users' Meeting, the workshop will be held one week later than originally scheduled — it will take place on Thursday, October 31 and Friday, November 1.

The *AIPS* Workshop will attempt to achieve a dialog between *AIPS* users and the *AIPS* group on a variety of topics of interest to users and, particularly, to programmers and those involved with management or development of *AIPS* systems.

Topics suggested for the Workshop include: transporting and installing *AIPS*; a "tutorial" on *AIPS* I/O for programmers; a forum on coding difficulties within *AIPS*; bringing single-dish data into *AIPS*; the *AIPS*/VLB interface; tips on optimising *AIPS* use for different types of data reduction; and discussion of recent, intended and desired developments in *AIPS*. We still welcome your suggestions for detailed topics, and we particularly invite non-NRAO *AIPS* users to make presentations describing experiences with, or viewpoints on, *AIPS* which they feel may be of interest to the *AIPS* community generally. The schedule for the Workshop has not been established in detail yet, and *now* is the time to let us know the topics in which you would be most interested.

At the end of this *AIPSLETTER* is a form on which we ask you to let us know if you would like to receive more detailed information about plans for the *AIPS* Workshop, and whether you are likely to attend. This will assist us in making the arrangements. We will send further information on the Workshop to those who return the form by 2 September to Alan Bridle in Charlottesville. Please pass a copy of the form on to anyone at your institution who might like to attend, but does not receive his or her own copy of the *AIPSLETTER*.

AIPS Publications

The Order Form at the end of this *AIPSLETTER* may be used to order the following memoranda and books. All previous memoranda are also available.

AIPS Memo No. 36: "Certification and Benchmarking of *AIPS* on the VAX-8600," Donald C. Wells, Gary A. Fickling, William D. Cotton, June 1985.

> The 15APR85 release of *AIPS* was installed on a VAX-8600 under VMS 4.1 and was tested using the "PFT" benchmarking and certification test. Installation was uneventful, and computed results agreed exactly with NRAO's VAX-11/780 in Charlottesville. Comparative timing data for the 8600 and 780 are tabulated. CPU-bound tasks executed up to 4.8× faster on the 8600 than on the 780. Tasks which had I/O or system calls which were not overlapped displayed lower ratios, some lower than 2×. The overall real-time ratio for the entire PFT test problem (dominated by compute-bound operations) was 3.8×. Data for the 780+AP and for VMS 4.0 versus VMS 3.7 are included to assist in interpretation of the measurements.

AIPS Memo No. 37: "Certification and Benchmarking of *AIPS* on the CONVEX C-1," Kerry C. Hilldrup, William D. Cotton, Donald C. Wells, July 1985.

> The 15APR85 release of *AIPS* has been installed on the CONVEX C-1 vector computer, and has been certified using the PFT benchmarking and certification test. Although a small number of compiler bugs were encountered, the *AIPS* application code was installed with only minimal modifications, and computed results agreed well with other implementations of *AIPS*. In the course of the implementation, the technology of the Clark CLEAN algorithm was advanced considerably; the final vectorized CLEAN algorithm on the C-1 is almost three times as fast as the current microcode algorithm on the FPS AP-120B array processor. Programs which were not vectorized generally executed on the C-1 at a somewhat slower rate than they achieve on the DEC VAX-8600, although a few, apparently dominated by system calls, achieved rather better performance on the C-1.

Going AIPS: W. D. Cotton and a cast of *AIPS*, Volumes 1 and 2, 15 July, 1985.

> A revised edition of *Going AIPS* has been released. It appears in two volumes. The first covers subjects of interest to general, scientific programmers wishing to code in *AIPS*: Skeleton Tasks, Getting Started — Tasks, The *AIPS* Program, Catalogues, Disk Files, High Level Utility Routines, and WaWa ("Easy") I/O. The second volume covers more advanced topics including tape drives, graphics displays, plotting, TV routines, array processors, tables, FITS format, and Z routines. People are encouraged to order Volume 2 only if they feel they will actually need it.

CHANGE.DOC: 15JUL85 Version as NEW

2567. *April 25, 1985* GRDAT *Eric*
Fixed include statements to refer to INCS: rather than UMAO:[WDC.AIPS].
Moved from 15OCT85.

2568. *April 26, 1985* ZDCHIN *Gary*
Due to changes I made for the 15JUL85 task activation, tasks were again responding to CTRL Y. ZDCHIN now detects when a process is a task and sets NOCONTROL_Y.
Moved from 15OCT85.

2569. *May 8, 1985* POPSGN *Bob/Eric*
Bob found a bug in POPSGN using the Cray. The next free cell for data values was not rounded correctly except for the case of 2 integers per floating-point value.
Moved from 15OCT85.

2570. *May 8, 1985* BLSUM *Eric*
Corrected the help file description of BCHAN and fixed a bug in the REDO option. The bug caused it to carry the old corners which were supposed to be forgotten.
Moved these corrections only from 15OCT85.

2571. *May 8, 1985* BLANK *Eric*
Corrected the history file description of the clipping and added the blanking parameter to the history. Also changed the REDO option to make it do the image over rather than just add to it.
Moved these changes only from 15OCT85.

2572. *May 9, 1985* TVSTAT, IMSTAT *Eric*
The depth (pixel coordinates on axes 3 – 7) for the position of the maximum flux was not being set correctly. Fixed AU6D to refer to the correct array subscript.
Moved this correction only from 15OCT85.

2573. *May 10, 1985* EXTDEST *Eric*
The error test for INEXT = ' ' was incorrect and the header was being updated even though the extension file was not deleted for some reason. Corrected AU8 to do a proper character compare and to test for there having been some successful deletion.
Moved from 15OCT85.

2574. *May 15, 1985* UVUNIF, UVGRID *Bill*
Test to see if the weight is a random or regular parameter is now to see if the length of the first (COMPLEX) axis is greater than 2. Data from the pipeline already had a random parameter "WEIGHT" which was confusing the routines. Also UVUNIF now protects itself better from data outside the grid. UVUNIF also now tells the size of the grid and the uniform weighting box.
Moved to 15OCT85 this date.

2575. *May 19, 1985* SETBSC *Eric*
Failed to do the right thing for constant, non-zero images. Changed it to branch out without trying to force 0.0 to be an exact integer in this case.
Moved from 15OCT85.

2576. *May 19, 1985* CORMS *Eric*
Added test for no valid output points. Added APARM(4) through APARM(7) to the history file. Corrected noise computation for the amplitude operation. Changed it to admit that it blanks on noise or S/N all the time despite the setting of APARM(8).
Moved these corrections (only) from 15OCT85.

2577. *May 21, 1985* FFT *Bill*

Corrected call sequence to DSKFFT.
Moved to 15OCT85 this date.

2578. *May 28, 1985* Bug fixes *Eric*

Fixed a bunch of little bugs, most of which were discovered on the Cray:

- XMOM — Fixed bad call sequence to ZPHFIL added when new SC files were installed.
- MAKOUT — Changed to use CHPAC2 rather than the incorrect CHPACK.
- PROMPT — Changed output to be null (zeros) after the initial prompt character.
- RDUSER — Changed it to set the prompt symbol in the standard way.
- AU1A — Changed to use the correct CHPACK rather than CHCOPY when displaying "*all 0", *et al.* (for INPUTS).
- AU2 — Changed to use the correct ZTCLOS on the Help file rather than a simple — and wrong — ZCLOSE (for GO and TPUT).
- PRTIM — Changed the format used for the column number line since it was overflowing the buffer with unneeded blanks.
- UVMAP — Changed the buffer size computations in VISRD (a complex number is 2 single floating numbers, not a double precision number!) and in CONGRD (too many vis records required since the sector size on Crays is 1024 *AIPS* bytes).

Moved from 15OCT85, nowhere else.

2579. *May 29, 1985* PATGN *Thad*

Changed the maximum number of open maps to two in order to allow for scratch files.
Moved from 15OCT85, nowhere else.

2580. *May 29, 1985* Bugs *Eric*

Corrected:

- RM.HLP — BADDISK was added to the code, but left off the inputs file.
- QMSPL — Failed to initialize a needed parameter — led to 0 divide on 'QRAN', *et al.* plots.

Moved from 15OCT85, nowhere else.

2581. *June 7, 1985* HISCOP *Eric/Kerry*

The Cray has turned up another bug: HICARD, used for an ENCODE buffer, was declared INTEGER*2(36) and equivalenced to MSGTXT which is REAL*4(20). On VAXes this is okay, but on Crays an I*2 is as long as an R*4. All packed strings must be REAL*4 variables. Fixed it here.
Moved from 15OCT85, nowhere else.

2582. *June 7, 1985* Plot paraforms *Eric*

Corrected the common ordering in PFPL1, PFPL2, PFPL3, PLROW, and PLMAKE. These routines need work which was done only in 15OCT85.

- PFPL1 — Corrected characters around edge initialization.
- PFPL2 — Put secondary labeling in common (was declared as if it were there), corrected positioning of secondary labels.
- PFPL3 — Corrected plot labeling error (it reset a corner and the coordinate reference pixels erroneously — leading to an obviously bad plot).
- PLROW — Put secondary labeling in common (was declared as if it were there), corrected positioning of secondary labels.

Moved these corrections from 15OCT85.

2583. *June 7, 1985* BOUNDS *Eric*

Changed call sequence of BOUNDS to receive two test values and to return an error code. Changed the testing inside to allow some values very slightly outside the formal limits. Changed AU1A (verbs INPUTS and INP) call to BOUNDS and changed AU2 (verbs GO and TPUT) to call BOUNDS to do the limit checking.
Moved nowhere.

2584. *June 7, 1985* YCRCTL (M75) *Scott Allendorf/Eric*

Fixed typo in YCRCTL for the Model 75 I^2S: IB changed to IV.
Moved from 15OCT85, nowhere else.

2585. *July 2, 1985* Password *Eric/Kerry*

UNIX can handle an 8-character password easily, but more characters will require special coding. Changed FILINI, FILAIP, and FILAI2 so that the *AIPS* manager default password will be only 8 non-blank characters long. Also corrected two serious errors in FILAI2: changed MSGWRT calls with an uninitialized N8 to ZTTYIO calls and changed a typo from FINDONEN1 to FIND, ONE. In FILINI, LSIZE was not declared which is an error since it is an INTEGER*4.
Moved from 15OCT85 this date, nowhere else.

2586. *July 4, 1985* VSCAL *Bill*

Added IRET to call sequence of ZPHFIL in SCLMOD, this error was causing an access violation.
Moved to 15OCT85 this date.

2587. *July 5, 1985* task starting *Eric*

There was a possibility of a timing problem in the intertask communication. Added an extra loop to AU2, AIPSC, and QMNGR to check just once more when an apparent abort has occurred. Found undeclared variables: IER and N256 in QMNGR (the latter also not DATAed and hence a real error) and IRETCD, ITEMP, and LSIZE in AIPSC (the latter is an I*4 and hence was a real error). Kerry also noted that ISIZE in CU2 was declared I*2 — also an error.
Moved from 15OCT85 this date.

2588. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

Many changes were made to clean up the code for 15JUL85. See the lengthy listings for this date in the 15OCT85 CHANGE.DOC file for details.
Moved from 15OCT85 and to UNIX and the VP Cray.

2589. *July 11, 1985* POPSGN *Kerry*

Changed the dimension of the REAL array VERSON from 5 to 12. Also changed the FORMAT statement involving user input for VERSON.
Moved from 15OCT85 same date.

CHANGE.DOC: 15OCT85 Version as TST

2590. *April 25, 1985* GRDAT *Eric*

Fixed include statements to refer to INCS: rather than UMAO:[WDC.AIPS].
Moved to 15JUL85, nowhere else.

2591. *April 26, 1985* ZDCHIN *Gary*

Due to changes I made for the 15JUL85 task activation subprocesses were again responding to CTRL Y. ZDCHIN now detects when a process is a task and sets NOCONTROL_Y.
Moved to 15JUL85.

2592. *April 30, 1985* ABACKUP, ARESTORE *Gary*

Added from CHKOUT history by Editors: DAO*n* disk logical names corrected by one.
Moved nowhere.

2593. *May 1, 1985* POPSGN *Bob/Eric*

Bob found a bug in POPSGN using the Cray. The next free cell for data values was not rounded correctly except for the case of 2 integers per floating-point number.
Moved nowhere.

2594. *May 1, 1985* POPS strings *Eric*

The COS experience has also pointed out a poor decision in the *AIPS* design for *POPS*. It was originally decided to make character strings in *POPS* be packed and to use only the number of floating point locations absolutely required. That would be fine except that we do an equivalence to a long list of variable names through the DAPL include. Changed the design so that DAPL is not machine dependent and strings occupy as many floating locations as would be required on a machine with 4 characters per floating. The strings will still be packed, however and no change in the K array should result on VAXes and other "ordinary" machines.
Changed:

- POPSGN — Changed the space required computation.
- PSEUDO — Changed the space required computation for STRING.
- AU1A — For INPUTS, changed string element length in addressing.
- AU2 — For GO and TPUT, changed handling of total size of input adverb array and counting of addresses.
- AU2A — For TGET, changed handling of total size of output adverb array and counting of addresses.
- ASSIGN — Changed length of string element in addressing.
- MASSGN — Changed length of string element in addressing.
- SUBS — Changed length of string element in computing offset address of the array element.
- EQUIV — Changed lengths of string elements in addressing.
- GETFLD — Changed length of storage for string constant.
- CONCAT — Changed length of storage for temporary string.
- HELPS — Changed length of storage for temporary string.
- QUICK — Changed length of storage for string constant for CHAR and changed length of string element in addressing for READ and PRINT.

Moved nowhere.

2595. *May 7, 1985* DOALIGN *Eric*

When I looked into the question of how tasks align two images, I found that they were all different! So, I have changed the definition of DOALIGN a bit and corrected the six tasks involved. If DOALIGN is true (now defined as ≥ 0.1), the two images must have the same coordinate systems (except that the reference pixels and image dimensions may differ) and are aligned by their coordinate values. If DOALIGN is false (now defined as ≤ -0.1), the two images are aligned by an offset from their reference pixels only. If DOALIGN is zero (defined as $-0.1 <$ DOALIGN < 0.1), then the images are aligned by the coordinate values at the lower left corner, computed linearly ignoring rotation and no other axis tests are made. The allowed inaccuracy will be 0.2 pixels. Changed DOALIGN.HLP to describe this new convention.
Moved nowhere.

2596. *May 7, 1985* BLSUM *Eric*

BLSUM followed the DOALIGN convention except for the near zero part. Changed it to support the full convention and to test that the second bottom left corner is at an integer pixel position (within 0.2). Changed it to select the overlapping subimage in case the second is too small or offset to support the full subimage specified by the user for the primary image. Added adverb DOINVERS to convey the desire to sum all pixels outside the blotch areas (true) or inside the areas (false). Changed it to use the new printer width and the standard subroutine (PRTLIN) for printing either to the CRT or line printer. Corrected bug in the REDO option as well. Changed help file to explain new DOALIGN, to remove leftover verbiage from BLANK, to correct the description of BCHAN, and to add the DOINVERS adverb. Changed includes DBLS.INC and CBLS.INC to add the DOINVERS adverb. Changed PRTLIN as well to avoid conversation with the user (DOCRT true) if it's the first page or if the number of "previous" lines has the "magic" value of 999.
Moved nowhere.

2597. *May 7, 1985* Printer width *Eric*

Modified IDCH.INC, DDCH.INC, CDCH.INC, ZDCHIN (MC4), ZDCHIN (VAX), SETPAR, FILAIP, and FILAI2 to add the parameter NCHPRT, the width of the line printer. FILAI2 has a hard-coded 132 to avoid yet another installation question for now. Our Versatek was broken for a while and it would have been nice to get meaningful printout on alternative (but narrower) devices. It will be a while until all applications honor this parameter and they will probably only handle two cases: 132 and 72. The latter case also applies to the terminal.
Moved nowhere.

2598. *May 8, 1985* BLANK *Eric*

BLANK followed the DOALIGN convention except for the near zero part. Changed it to support the full convention and to test that the second bottom left corner is at an integer pixel position (within 0.2). Changed it to select the overlapping subimage in case the second is too small or offset to support the full subimage specified by the user for the primary image. Added the adverb DOINVERS to specify whether, on TV blanking, the blanked pixels are inside (true) or outside (false) of the blotch regions. Added DOINVERS and value of blanked pixels to history file and corrected description of flux cutoff blanking in the history file. Changed the REDO option to completely redo the current image rather than to add to that image. Changed the help file for DOALIGN and DOINVERS and added DOINVERS to DBLK.INC and CBLK.INC.
Moved nowhere.

2599. *May 8, 1985* TVSTAT, IMSTAT *Eric*

Changed AU6D to support the DOINVERS adverb. TVSTAT will now determine statistics over the entire image displayed on the TV except for the blotch regions if DOINVERS true. IMSTAT will now determine statistics over the entire image except for the region enclosed by BLC to TRC if DOINVERS true. If DOINVERS is false, the statistics are determined inside the blotch regions and BLC to TRC, respectively. Changed the TVSTAT and IMSTAT help files to point this out and rewrote the DOINVERS help file to give the adverb its new meaning and to describe the 2 verbs and 3 tasks which use it.
Moved nowhere.

2600. *May 8, 1985* FITTP, UVLOD *Gary*

If FITTP was writing ANtenna files in the new format, and the DOTAB adverb was set to false, then FITTP would write the ANtenna file correctly but would not write the "EXTENSION = T" line in the header. I modified UVLOD so that it will try to read antenna files even without the extension flag being set. Since it is prepared to handle an end of file at this point anyway, this should cause no problem.
Moved nowhere.

2601. *May 10, 1985* EXTDEST *Eric*

The error test for INEXT = ' ' was incorrect and the header was being updated even though the extension file was not deleted for some reason. Corrected AU8 to do a proper character compare and to test for there having been some successful deletion.
Moved to 15JUL85, nowhere else.

2602. *May 10, 1985* JMFIT *Fred*

Added from CHKOUT history by Editors: "to add trim."
Moved nowhere.

2603. *May 14, 1985* ABACKUP, ARESTORE *Gary*

These utility command procedures have been modified to allow the back up of either TST or NEW/OLD. Because Save/Get files, message files, and TGET files are in different directories than the data for TST, the ability to back up and restore these files has gone away until I get the time to make more radical changes to these procs.
Moved nowhere.

2604. *May 14, 1985* VBANT, *GAI.INC *John*

VBANT sets up the gain record format using an equivalence statement in EGAI.INC. The common statements have been eliminated. The VBANT GA records are now again consistent with those produced by VSCAL and ASCAL.
Moved nowhere.

2605. *May 15, 1985* UVUNIF, UVGRID *Bill*

Test to see if the weight is a random or regular parameter is now to see if the length of the first (COMPLEX) axis is greater that 2. Data from the pipeline already had a random parameter "WEIGHT" which was confusing the routines. Also UVUNIF now protects itself better from data outside the grid. UVUNIF also now tells the size of the grid and the uniform weighting box.
Moved to 15JUL85 this date.

2606. *May 15, 1985* CALCOP *Bill*

If the scratch file is created, the catalogue header is now updated with one which describes the data.
Moved nowhere.

2607. *May 15, 1985* TAFFY *Don/Bill*

As an undocumented feature, the logic of TAFFY was supposed to enable writing either fewer or more lines than the size of the input window specified by BLC and TRC. A minor bug prevented this feature from working; it has been corrected and an error test and message inserted.
Moved nowhere.

2608. *May 15, 1985* PGEOM, PGEOM.HLP *Thad*

The boundary logic in PGEOM was tested and generalized. The parameters were also simplified.
Moved nowhere.

2609. *May 15, 1985* BCAL1 *Craig*

Added from CHKOUT history by Editors: Added baseline statistics and fixed table headers.
Moved nowhere.

2610. *May 17, 1985* MWFLT *Thad*

Added from CHKOUT history by Editors: "make the program more robust."
Moved nowhere.

2611. *May 19, 1985* Plotting, CNTR *Eric*

Added the date, time, and version number of the plot file to the plots. Also created subroutine HIPLOT to add a similar record to the file's history extension file. Changed LTYPE so that negative values suppress the displayed string. Changed help files for LTYPE and CNTR. Changed subroutines COMLAB (new call sequence) to put the new string in the plot and CLAB1 and LABINI to deal with ABS(LTYPE). LABINI also increases the count of lines above the plot. Changed CNTR to use new COMLAB call sequence, to allow negative LTYPEs, and to call HIPLOT. Dropped INTYPE adverb from CNTR and its Help file — all file names are now unique without a type.
Moved nowhere.

2612. *May 19, 1985* PCNTR *Eric*

Added the date, time, and version number of the plot file to the plots and a similar record to the file's history extension file. Changed LTYPE so that negative values suppress the displayed string. To do this, changed PCNTR to use new COMLAB call sequence, to allow negative LTYPEs, and to call HIPLOT. Dropped INTYPE adverb — all file names are now unique without type. PCNTR used to do image alignment solely by offset in pixels from the reference pixel and required everything to agree without shifts when DOALIGN was true. Changed it to support the full new convention for DOALIGN. Changed it to select the overlapping subimages in case the second or third are too small or offset to support the full subimage specified by the user for the primary image. Also changed PCNTR to use physical units for the appropriate adverbs. FACTOR is now the length of a polarization of 1 Jy/beam (or whatever the P map units are). ICUT and PCUT are in the units of the I and P images and have no defaults. Also changed the help file for all this.
Moved nowhere.

2613. *May 19, 1985* GREYS *Eric*

Added the date, time, and version number of the plot file to the plots and a similar record to the file's history extension file. Changed LTYPE so that negative values suppress the displayed string. To do this, changed GREYS to plot the date-time-version string, to allow negative LTYPEs, and to call HIPLOT. GREYS used to do image alignment solely by offset in pixels from the reference pixel and required everything to agree without shifts when DOALIGN was true. Changed it to support the full new convention for DOALIGN. Changed it to select overlapping subimages in case the second is too small or offset to support the full subimage specified by the user for the primary image. Also added code to allow TRC(3) to reference a 2^{nd} plane in the image to be used for the contour plane. Added new adverb DOWEDGE to do a grey-scale wedge (if > 0.0) along the bottom or right (if > 1.0) edges of the regular grey-scale image. Created new help file for DOWEDGE and changed POPSDAT.HLP, DAPL.INC, and CAPL.INC. Also changed the help file for all this and the includes DGRY.INC and CGRY.INC to hold the DOWEDGE parameters.
Moved nowhere.

2614. *May 19, 1985* COMB *Eric*

COMB was very strange in its handling of alignment, forcing exact alignment of all parameters including image size. Changed it to allow the images to align by value along all real axes (more than 1 point on the axis), following the new DOALIGN standards. This required changing a bunch of I/O pointers, windows, etc. Changed the CLIP algorithm to clip when APARM(1) > MAP(2) > APARM(2) or, if APARM(2) > APARM(1), when MAP(2) > APARM(2) or MAP(2) < APARM(1). Changed the CLIP operation and blanking to use image units rather than fractional ones, although the defaults must be some fraction of the image peak. Changed the REAL and IMAG operations to allow adding a bias given by APARM(3). Changed the formats which display the algorithm to allow full dynamic range (*i.e.*, F9.3 was changed to 1PE11.3). Added test for no valid output points and cleaned up blanking test. Changed it to substitute 0.0 for all blanking when APARM(8) $\leq$ 0. Changed the COMB and COMBCODE help files to explain all this and the includes DCOM.INC and CCOM.INC to hold new pointers.
Moved nowhere.

2615. *May 19, 1985* CORMS *Eric*

CORMS was very strange in its handling of alignment, forcing exact alignment of all parameters including image size. Changed it to allow the images to align by value along all real axes (more than 1 point on the axis), following the new DOALIGN standards. This required changing a bunch of I/O pointers, windows, etc. Changed blanking to use image units rather than fractional ones. (CORMS has no defaults on the blanking cutoffs.) Changed tests on APARM(4) and APARM(8) to be consistent with *AIPS* standard logicals ($\leq$ 0.0 means false) and on APARM(7) to be self-consistent. Add BADDISK adverb to code. Added test for no valid output points and cleaned up blanking tests. Changed the formats which display the algorithm to allow full dynamic range (*i.e.*, F9.3 was changed to 1PE11.3). Added APARM(4) through APARM(7) to the history file. Corrected computation of noise in the amplitude operation. Changed handling of blanking — it was blanking on noise or S/N all the time, but described it only if APARM(8) > 0.0. Changed it to substitute 0.0 for all blanking when APARM(8) $\leq$ 0. Changed CORMS to tell the truth when it puts out noise images by doing the same blanking on those as it does when it puts out signal images. Changed CORMS to allow S/N blanking on SPIX and OPTD outputs and changed the help file to tell the user which combinations are blocked or not recommended. Changed the help file in numerous other ways to explain all this.
Moved nowhere.

2616. *May 19, 1985* MCREAT, UVCREA *Eric*

Added new error return code 6 for missing catalog. During the testing of COMB it became clear that MCREAT would die if one could not create a catalog on some disk even when OUTDISK=0. The new error code will not stop MCREAT or UVCREA from trying other disks when they are allowed to do so.
Moved nowhere.

2617. *May 19, 1985* SETBSC *Eric*

Failed to do the right thing for constant, non-zero images. Changed it to branch out without trying to force 0.0 to be an exact integer in this case.
Moved nowhere.

2618. *May 20, 1985* PRTGA *John*

PRTGA now correctly reads the GA files produced by ASCAL, VSCAL and VBANT. PRTGA also reads the T_{sys}'s and T_{ant}'s saved in the VBANT GA file. The last fix to PRTGA was to equivalence the T_{sys} and T_{ant} array to the correct location in the GA record.
Moved nowhere.

2619. *May 20, 1985* GAPLT *John*

Fixed GAPLT to read the T_{sys}'s and T_{ant}'s stored in the GA files created by VBANT. The same equivalence statements as are in VBANT are now in GAPLT.
Moved nowhere.

2620. *May 20, 1985* Plotting *Eric*

The date, time, and version number of the plot file needed to be added also to other kinds of plots. In addition, HIPLOT needs to be called to add a similar record to the file's history extension file. Changed:

IMEAN — Changed to add plot and HI lines.
PROFL — Modified to add only the HI file line — the plot is too messy to add more text.
SLBINI — Changed to allow negative LTYPEs.
SL2PL — Changed to do plot line based on LTYPE and do HI.
SL2PL.HLP — Changed to allow and explain negative LTYPE.
GNPLT — Changed to do plot and HI lines, cleaned up top lines.
UVPLT — Changed to add plot and HI lines.

Moved nowhere.

2621. *May 21, 1985* PATGN *Thad*

The maximum number of open map files was being set to 1 making it impossible to use a scratch file when working with integer maps. Changed this value to 2.
Moved nowhere.

2622. *May 21, 1985* IMCREA *Bill*

Fixed a bug in the computation of the number of channels in the file.
Moved nowhere

2623. *May 21, 1985* UVGET *Bill*

Fixed bug with UVRANGE, the *uv* values were not being converted to wavelengths.
Moved nowhere.

2624. *May 21, 1985* MAKMAP *Bill*

Fixed bugs in handling of UVRANGE.
Moved nowhere.

2625. *May 21, 1985* CALCOP *Bill*

Modified to update catalogue header in output file after it is finished writing. Also added D/CUVH.INC includes.
Moved nowhere.

2626. *May 21, 1985* FFT *Bill*

Corrected call sequence to DSKFFT.
Moved to 15JUL85 this date.

2627. *May 21, 1985* CLEANing *Bill*

Big shakeup in the way CLEAN components are found in the B. Clark in-AP CLEAN. The original version stored the residual x and y positions in one word as $y + x * 2^{14}$. Since the FPS APs have 28-bit mantissas this works — unless the AP is rolled, or a large map is being made on a pseudo AP with fewer than 28 bits in the mantissa (usually the case). The new version stores x and y in separate words (meaning of course, fewer residuals in many cases). The affected tasks were MX and APCLN which now store residuals as 3 words each. The primary subroutines changed were CLNSUB and MULCLN which appear as microcode in NRAO.AP, as Fortran (QMULCL, QCLNSU) in SAPSUB and as linked FPS versions in FPSSUB and [AIPS.*date*.FPS.SUB4K]. Also the microcode libraries were renamed from WDC.AP and WDC.LIB to NRAO.AP and NRAO.LIB and the command procedure for linking VFC routines VFC.COM was updated.
Moved nowhere.

2628. *May 23, 1985* SETBSC *Gary/Thad*

Loss of precision in this routine was causing scaling problems. Changed DMAX and DMIN from R*4 to R*8.
Moved nowhere.

2629. *May 24, 1985* FFT *Pat*

There was a typo in the modified call to routine DSKFFT. This was causing it to use the wrong buffer. The version in NEW had been correctly modified.
Moved from VLA, nowhere else.

2630. *May 28, 1985* Bug fixes *Eric*

Fixed a bunch of little bugs, most of which were discovered on the Cray:

XMOM — Fixed bad call sequence to ZPHFIL added when new SC files were installed.
MAKOUT — Changed to use CHPAC2 rather than the incorrect CHPACK.
PROMPT — Changed output to be null (zeros) after the initial prompt character.
RDUSER — Changed it to set the prompt symbol in the standard way.
AU1A — Changed to use the correct CHPACK rather than CHCOPY when displaying "*all 0", *et al.* (for INPUTS).
AU2 — Changed to use the correct ZTCLOS on the Help file rather than a simple — and wrong — ZCLOSE (for GO and TPUT).
PRTIM — Changed the format used for the column number line since it was overflowing the buffer with unneeded blanks.
UVMAP — Changed the buffer size computations in VISRD (a complex number is 2 single floating numbers, not a double precision number!) and in CONGRD (too many vis records required since the sector size on Crays is 1024 *AIPS* bytes).

Moved to 15JUL85, nowhere else.

2631. *May 29, 1985* PGEOM, PGEOM.HLP *Thad*

Added a deprojection capability to PGEOM. Now the program will deproject a rotated elliptical source while it transforms it from rectangular to polar coordinates. It will invert the specified projection during the reverse transformation. The user must now specify the inclination and rotation angle of the original source.
Moved nowhere.

2632. *May 29, 1985* VBPLT *Bill*

Fixed problems reading CC table. Added capability to use gaussian components as the model. Did a lot of standardization such as removing the IMPLICIT DOUBLE PRECISION statements and explicitly declaring all variables, removing literals and expressions from call sequences and limited subroutine names to 6 characters. Also modified DVBP.INC, CVBP.INC and VBPLT.HLP.
Moved nowhere.

2633. *May 29, 1985* Bugs *Eric*

Corrected:

RM.HLP — BADDISK was added to the code, but left off the inputs file.
QMSPL — Failed to initialize a needed parameter — led to 0 divide on 'QRAN', *et al.* plots.

Moved to 15JUL85, nowhere else.

2634. *May 31, 1985* PRTCC *Bill*

Added adverb INTYPE to allow it to work on gaussian model tables associated with *uv* data files. Also fixed logic determining component type, this value is a real and an integer was expected. Also changed: PRTCC.HLP, DPCC.INC, CPCC.INC.
Moved nowhere.

2635. *June 3, 1985* BOUNDS *Eric*

Changed call sequence of BOUNDS to receive two test values and to return an error code. Changed the testing inside to allow some values very slightly outside the formal limits. Changed AU1A (verbs INPUTS and INP) call to BOUNDS and changed AU2 (verbs GO and TPUT) to call BOUNDS to do the limit checking.
Moved nowhere.

2636. *June 4, 1985* Least squares routines *Bill*

An *AIPS*-ized version of the *LINPAC* routines DDOT, DMACH, DNRM2 and the least squares routine DVDMIN. Functions were converted to subroutines.
Moved nowhere.

2637. *June 4, 1985* UVFIT *Bill*

New task which gaussian models to *uv* data. Fits up to 4 elliptical or circular gaussians and/or antenna amplitude gains to up to 2000 visibilities. Also UVFIT.HLP.
Moved nowhere.

2638. *June 7, 1985* PGEOM, PGEOM.HLP *Thad*

Added logic to unwrap spiral objects given a reference radius (see PGEOM.HLP for details). Also changed the header logic so that it tells the truth(?) in polar coordinates and recovers the correct header when returning from polar to rectangular coordinates. Certain implicit declarations were also made explicit.
Moved nowhere.

2639. *June 7, 1985* YCRCTL (M75) *Scott Allendorf/Eric*

Typo in YCRCTL for the Model 75 I^2S: IB should be IV.
Moved to 15JUL85, nowhere else.

2640. *June 7, 1985* Plot utilities *Eric*

Revised the routines used by PFPL*n* in several ways including creating includes for the PLTCOM common and adding the last vector position and plot file version number to the common. Individual changes were:

DPLT.INC — Common for map I/O and plot parms used by PFPL*n*.

CPLT.INC — Ditto, includes moving most parameters from the /MAPHDR/ common to /PLTCOM/. The order of /MAPHDR/ before the change should have prevented axis labeling from working.

DELEXT — Revised to allow initial status to be left on file: use stat = RDRD or WRWR to request this.

INTEDG — NEW: subroutine to compute intersections of a line with the edges of a box.

INTMIO — Allow HDWRIT mode (catalog marked write, but file opened non-exclusive). Corrected precursor remarks to point out that BLC, TRC, and NAME are in/out parameters and added code to support that for all parts of NAME.

PLEND — Replaced PLTCOM statements with includes, added call to HIPLOT on successful completion and calls to delete the PL file on failure. New call sequence with a debug parameter and no buffer. Changed to skip clean up if plot file not open (requires task to zero GPHIND at start). Fixed call to DIE.

PLGRY — Replaced PLTCOM statements with includes. Changed to make blank pixels equal to the min of PIXRANGE rather than the max.

PLMAKE — Replaced PLTCOM and MAPHDR statements with includes and changed it to switch the file status to read from write in the file common and catalog. Removed plot file creation message and added initialization on the bad vector count and previous position. Added plot type to call sequence.

PLPOS — Replaced PLTCOM statements with includes and changed handling of positions off the edge of the plot. Basically such positions are counted and stored in XLAST, YLAST but no command is issued to the plot file.

PLVEC — Rewritten to use INTEDG to do correct interpolation to plot vectors which are only partly inside plot area.

SLBINI — Corrected error — the current value of the label parm including sign must be passed to LABINI.

Moved nowhere.

2641. *June 7, 1985* PLROW *Eric*

Changed to honor blanking, to interpolate rows shorter than 256 pixels, and to do hidden line handling. Changed OFFSET adverb to be in map units and to control solely the scaling of the plotted flux. Changed to label the *y* axis in units of the *y* axis of the image. Changed to use PLT includes and corrected MAPHDR common and to draw date/time/version string if LTYPE > 0. Dropped adverb INTYPE — specified MA in the code. Put secondary labeling parms in common (they were declared as if they were already there). Added code to force task to use one plane only and to prevent backward windows. Changed to fill in all adverb values before PL file creation. Changed to handle strings correctly as packed. This task is now useful.
Moved nowhere.

2642. *June 7, 1985* Plot tasks *Eric*

Dropped INTYPE from the help files and code and continued the corrections above to the tasks:

PFPL1 — Corrected the characters around the edge initialization — there were too many spares, 0 is normal. Changed to use PLT includes and corrected MAPHDR common and to draw date/time/version title if LTYPE > 0. Dropped adverb INTYPE — specified MA in the code. Put the secondary labeling lines in a common and added code to display them — space for them was already created. Renamed subroutines. Changed to provide correct border space for the grey scale plot. Added code to have all adverb defaults filled in prior to PL file creation. Added code to prevent backward windows (which are allowed by INTMIO). Changed to handle strings correctly as packed.

PFPL2 — Changed to use PLT includes and to draw date/time/version string if LTYPE > 0 and corrected MAPHDR common. Dropped adverb INTYPE — specified MA in the code. Put the secondary text parms in the labeling common — they were declared, but not in common. Corrected positioning of secondary lines and dropped the option to suppress them. Renamed subroutines. Added code to have all adverb defaults filled in prior to PL file creation. Changed to handle strings correctly as packed. Changed to honor blanking.

PFPL3 — Changed to use PLT includes and corrected MAPHDR common and to draw date/time/version string if LTYPE > 0. Dropped adverb INTYPE — specified MA in the code. Corrected plot labeling error (it reset a corner and the coordinate reference pixels erroneously — leading to an obviously bad plot). Also corrected the axis labels — they were incorrect and also machine dependent. Renamed subroutines. Added code to have all adverb defaults filled in prior to PL file creation. Added code to prevent backward windows (which are allowed by INTMIO). Changed to handle strings correctly as packed. Changed to ignore blanked pixels.

TKPL — Added PCNTR type plots to support for ASPMM.

Moved nowhere.

2643. *June 7, 1985* Drop INTYPE *Eric*

Dropped INTYPE from SLICE, PROFL and SL2PL help and Fortran files. Changed AU8A (EXTLIST) to support new addresses for the adverbs in these tasks plus tasks CNTR, PCNTR, IMEAN, etc. which were also off. In addition, added to AU8A code to handle new types for PFPL*n*.

Moved nowhere.

2644. *June 7, 1985* HISCOP *Eric/Kerry*

The Cray has turned up another bug: HICARD, used for an ENCODE buffer, was declared INTEGER*2(36) and equivalenced to MSGTXT which is REAL*4(20). On VAXes this is okay, but on Crays an I*2 is as long as a R*4. All packed strings must be REAL*4 variables. Fixed it here.

Moved to 15JUL85, nowhere else.

2645. *June 7, 1985* WHATSNEW *Eric*

Added stuff to date — left old stuff in for now.

Moved nowhere.

2646. *June 12, 1985* VMS MACRO Routines *Pat*

In order to use shareable images under VMS it is a considerable help to have all routines written in position-independent code. The following MACRO routines were modified to achieve this:

ZDESTR	ZESTEX	ZEXIST	ZPARS	ZQASSN	ZQCRE3	ZQCREA
ZQDEVN	ZQRENA	ZQTAPE	ZQTRUN	ZQWIO	ZTACT2	ZTKQIO

Most of the changes were trivial — changing .LONG to .ADDRESS, and careful declarations of QIO parameters P1 to P6. Routine ZQTAPE now does a single QIO for multiple block and record skips.

Moved nowhere.

2647. *June 12, 1985* Plot programs *Eric*

PROFL — Corrected bug introduced 7 June. Also reversed the meaning of XINC and YINC: XINC is the increment between plotted *columns* and YINC the increment between plotted *rows*.

PROFL.HLP — Changed the explanations of XINC and YINC. Added PLROW to the EXPLAIN file portion.

GREYS — Corrected possible overflow put in code with the wedge option.

Moved nowhere.

2648. *June 13, 1985* HGEOM, HGEOM.HLP *Thad*

New task to transform an image so that it is consistent with another one (headers the same). For each output pixel the program determines the corresponding sky position using the header of the second picture. It then uses the calculated sky position to determine the corresponding input pixel using the header of the first picture. This algorithm is completely general and can even transform from one type of projection to another. This task is useful for data comparison and may be used for mosaicing in the future. Also HGEOM.HLP.
Moved nowhere.

2649. *June 17, 1985* PGEOM, MWFLT *Thad*

Added from CHKOUT history by Editors: PGEOM: "add test for loss of significant axes," "make implicit declaration explicit," "improve documentation," "fix output message," "default for boundary size;" PGEOM.HLP: "improve;" MWFLT.HLP: "improve."
Moved nowhere.

2650. *June 19, 1985* Plot programs *Eric*

More work:

IRING — Rearranged common to be in standard order, added top line to give version/date/time text, cleaned up a little.

IRING.HLP — Cleaned up the typing some.

PLCUB — Corrected a variety of things: will now give correct flux labels and will fill the last plots (repeating some of the x-axis slices). Added options YINC, ZINC, and PIXRANGE, dropping the detailed self-scaling it once did. Changed to use standard labeling routines and to support the various labeling types.

PLCUB.HLP — Made the Help file more standard and added the new options.

CTICS — Changed call sequence to add a parameter giving the x value at which a y axis is plotted or the y value at which an x axis is plotted for new axis types 3 and 4. These new types are for "subplots" and only draw one axis line (omitting the top or right edges) with fewer tick marks.

CLAB1 — Changed call sequence to CTICS and changed to have LTYPE 2 draw tick marks without tick value labels.

CLAB2 — NEW: like CLAB1 with extra arguments to draw labels and ticks for subplots.

LTYPE.HLP — Changed description of LTYPE = 2.

PROFL — Corrected handling of return code to report all fatal errors and changed CTICS to PFTICS in a comment.

GNPLT — Changed call sequence to CTICS.

Moved nowhere.

2651. *June 19, 1985* ASCAL *Bill*

Converted all COMPLEX variables and arithmetic in GCALC to REAL*4.
Moved nowhere.

2652. *June 21, 1985* VBPLT *Bill*

Fixed a couple bugs in the gaussian model plotting portion. Added the capability to plot models composed of uniform, optically thin spheres. Also VBPLT.HLP.
Moved nowhere.

2653. *June 21, 1985* UVFIT *Bill*

Added an option to fit optically thin, uniform spheres. Also changed: UVFIT.HLP, DVBP.INC, CVBP.INC.
Moved nowhere.

2654. *June 21, 1985* PLNPUT *Bill*

Replaced call to IROUND with SIGN function so the loop will vectorize. The old version sent an R*8 value to IROUND which expects an R*4 — this is an error on many machines which have more bits in the exponent for double precision floating than for single precision.
Moved nowhere.

2655. *June 21, 1985* ASCAL *Bill*

Declared variable array dimension argument NMAX.
Moved nowhere.

2656. *June 24, 1985* MV2C06CC. *Bill*

Added uniform, optically thin spheres to the defined model types.
Moved nowhere.

2657. *June 24, 1985* New adverbs *Bill*

Added new adverbs for the calibration and editing software:

SOURCES — The names (16 char) of up to 30 sources.
CALSOUR — The names (16 char) of up to 30 sources to be used as calibrators.
TIMERANG — Start and end times.
SUBARR — Subarray number.
BIF — First IF to use.
EIF — Highest IF to use.
ANTENNAS — Up to 50 antennas selected or deselected.
BASELINE — Specifies baselines formed with ANTENNAS.
DOCALIB — Logical flag for applying calibration.
INTERPOL — Interpolation type.
SMOTYPE — Type of smoothing desired for calibration data.
INTPARM — Smoothing parameters.
FLAGVER — Version of the flaging table to use.
GAINVER — Input Gain table version number to use.
GAINUSE — Gain table version number for the smoothed table.
REASON — Reason for flagging data.

Changed: POPSDAT.HLP, DAPL.INC and CAPL.INC. Added: .HLP files for new adverbs (groan).
Moved nowhere.

2658. *June 24, 1985* Source name length *Bill*

The length of source names in the new editing and calibration routines (but not in the older code) allows up to 16 characters. Affected routines are DSEL.INC, UVGET, MAKMAP and SOUFIL; these have been corrected.
Moved nowhere.

2659. *June 26, 1985* More plotting *Eric*

Changed:

COORDD — Added code to convert large RAs to days in the sign character.
GAPLT — Added calls to HIPLOT and to create the version date time string at the top. Corrected some CHPACK calls to RCOPY and dropped local versions of CLAB1, CTICS, and COORDD. Added PIXRANGE adverb. A great many unused variables were removed from the declarations — some still appear in the excessive number of includes, however. This task (and others which use the same includes?) have 28 antennas built in at a very deep level — it should be 50 or more.
GAPLT.HLP — Changed XTYPE, YTYPE adverbs to the 1st parts of BPARM (those 2 adverbs are too dangerous!). Added description of how PIXRANGE is used here.
DGNP.INC — Added variables, deleted unused variables.
CGNP.INC — Changed adverb common.
CTICS — Changed to make LABTYP 7 also a time parameter.
CLAB1 — Added LABTYP 7 as "IAT (HOURS)" axis label and tests to skip even standard labels if CPREF and CTYP are both blank or CPREF = 0.0.
CLAB2 — As CLAB1.
PLCUB — Made more room for panel y-axis label, fixed the declarations (a significant number of unused variables were removed from the declarations). Changed to plot type 13.

Moved nowhere.

2660. *June 26, 1985* More plotting *Eric*

Changed:

VBPLT — Cleaned up some and added version string to plot and history file. Added axis type 12 for time in sexagesimal notation. Allowed a little more room around self-scale plots. Corrected model plotting code — it could screw up badly before. Changed to allow each plot to self-scale in y axis.

VBPLT.HLP — Added type 12 as x-axis default and explained the self scaling.

UVPLT — Added type 11 for time in sexagesimal and changed some CHPACKs to RCOPYs. Allowed a little more room around self-scale plots.

UVPLT.HLP — Added type 11 for time in sexagesimal.

AU8A — Added support for UVPLT/VBPLT axis types 9–12 and for GAPLT and PLCUB plot types in EXTLIST.

Moved nowhere.

2661. *June 26, 1985* YIMGIO (DEA) *Walter Jaffe/Eric*

Installed Walter's corrections to allow writing in any of the 4 directions.
Moved nowhere.

2662. *June 27, 1985* ASCAL *Fred/Bill*

Fixed a few bugs in GCALC introduced in the removal of complex arithmetic from GCALC. Fred's comment on the subject: "Shit!". It's too bad that many compilers mess up arithmetic with complex variables.
Moved nowhere.

2663. *June 28, 1985* MSGWRT recursion *Eric*

MSGWRT needs to expand its files a lot at times — but it cannot call ZEXPND because ZEXPND calls MSGWRT on error. Changed:

MSGWRT — To call ZMSGXP.

ZMSGXP — (MC4) version of ZEXPND, but writes errors to unit 6 directly.

ZEXPND — (MC4) changed PHNAME to the correct REAL*4 declaration.

ZMSGXP — (VMS) version of ZEXPND with writes to unit 6 on error and call to ZQMSGX rather than MSGWRT and ZQEXP calls.

ZQMSGX — (VMS) macro version of ZQEXP does not call ZQMSG.

Moved nowhere.

2664. *June 28, 1985* NINER *Thad*

Fixed some problems the program was having handling blanks.
Moved nowhere.

2665. *June 28, 1985* DOALIGN *Eric*

Apparently there are times when images get into *AIPS* with bad header information which users tolerate rather than going to the effort to correct. The recent changes to DOALIGN left such benighted users in some trouble — they could no longer tell programs to align images by pixel number alone with no regard to the header information. Therefore, I have added a value of DOALIGN = -2 (actually < -1.5) to convey that the user does not care how messed up the header information is and that images are to be aligned at pixel (1,1,...). Changed the Help files DOALIGN, BLANK, BLSUM, COMB, CORMS, GREYS, and PCNTR and the Fortran files BLANK, BLSUM, COMB, CORMS, GREYS, and PCNTR to support and explain this.
Moved nowhere.

2666. *June 28, 1985* COMB, CORMS *Eric*

Changed the handling of blanking even more. APARM(8) has a *reversed* meaning: it says to substitute 0.0 for blanks when true (> 0.0) and to use normal magic-value blanking when false (≤ 0.0). COMB no longer supplies any defaults for the clipping parameters APARM(9) and APARM(10). Changed COMB and CORMS help and fortran files, deleted the COMBCODE help file.
Moved nowhere.

2667. *June 28, 1985* MWFLT *Thad*

Fixed a small problem with the cutoff values for the alpha-trim operation due to truncation. Relabeled subroutine FILTER to make later modification easier.
Moved nowhere.

2668. *June 28, 1985* PATGN, PGEOM *Thad*

Added from CHKOUT history by Editors: PATGN: "improve readability" and PGEOM: "fix format statement bug."
Moved nowhere.

2669. *July 1, 1985* ASCAL *Bill*

Added a few comments to GCALC.
Moved nowhere.

2670. *July 1, 1985* Compilations *Eric*

All compile-replace and compile-link procedures on CVAX in the TST area have been changed to use the Fortran compiler options /STANDARD=SOURCE_FORM/WARNINGS=ALL. The former makes TAB characters and lower case illegal in code while the latter primarily requires that all variables be declared.
Moved nowhere.

2671. *July 2, 1985* Password *Eric/Kerry*

UNIX can handle an 8-character password easily, but more characters will require special coding. Changed FILINI, FILAIP, and FILAI2 so that the *AIPS* manager default password will be only 8 non-blank characters long. Also corrected two serious errors in FILAI2: changed MSGWRT calls with an uninitialized N8 to ZTTYIO calls and changed a typo from FINDONEN1 to FIND, ONE. In FILINI, LSIZE was not declared which is an error since it is an INTEGER*4.
Moved to 15JUL85 this date, nowhere else.

2672. *July 2, 1985* No-TV Y routines *Eric*

I have created a new subdirectory called [.APL.NUN] to hold stubbed versions of all Y routines. Almost all of these stubs emit an error message and return error code 2. YTVCIN actually does initialize the common, but with mostly null values. Even the highly generic Y routines have been given stubbed versions. Routines done:

YALUCT	YCHRW	YCNECT	YCONST	YCRCTL	YCUCOR	YCURSE
YFDBCK	YGGRAM	YGRAFE	YGRAPH	YGYHDR	YIFM	YIMGIO
YINIT	YISDRM	YISDSC	YISJMP	YISMPM	YLNCLR	YLOWON
YLUT	YMAGIC	YMKCUR	YMKHDR	YMNMAX	YOFM	YRHIST
YSCROL	YSHIFT	YSLECT	YSPLIT	YSTCUR	YTCOMP	YTVCIN
YTVCLS	YTVMC	YTVOPN	YZERO	YZOOMC		

Moved nowhere.

2673. *July 3, 1985* HGEOM.HLP *Thad*

Added from CHKOUT history by Editors: "fix IMSIZE discussion."
Moved nowhere.

2674. *July 4, 1985* VSCAL *Bill*

Added IRET to call sequence of ZPHFIL in SCLMOD; this error was causing an access violation.
Moved to 15JUL85 this date.

2675. *July 5, 1985* task starting *Eric*

There was a possibility of a timing problem in the intertask communication. Added an extra loop to AU2, AIPSC, and QMNGR to check just once more when an apparent abort has occurred. Found undeclared variables: IER and N256 in QMNGR (the latter also not DATAed and hence a real error) and IRETCD, ITEMP, and LSIZE in AIPSC (the latter is an I*4 and hence was a real error). Kerry also noted that ISIZE in CU2 was declared I*2 — also an error.
Moved to 15JUL85 this date, nowhere else.

2676. *July 8, 1985* BCAL2 *Craig*

The UNDO option was fixed. Previously the specification of OPCODE = 'UNDO' was ignored and data was altered in the same way as for any other OPCODE. The parameters used in the OPEN of the ASCII file passed from BCAL1 to BCAL2 were altered to conform to FORTRAN 77 standards. Also, thanks to the new compile proceedure, many undeclared variables were found and fixed. A large fraction were left over from FUDGE.
Moved nowhere.

2677. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

Once again the port of *AIPS* to non-VAX/VMS machines revealed a number of declaration errors. This is really getting tiresome. Unlike VMS, not all other operating systems have the luxury and reliability of a NOI4 compiler option. Similarly, other systems get bent out of shape when undeclared variables that default to REAL are used as array indices. INTEGER*2 variables being passed to a routine expecting INTEGER*4 (or vice versa) is another real joy to track down on a non-word/byte-swapped machine. Perhaps now that the VMS compilation procedures detect undeclared items, I can take a well-deserved vacation from this sort of crap. Also, several variables with names of the form N*n* were found to be uninitialized. On the VAX, these are initialized to zero at execution time (since memory is first zeroed) and these programs probably work well enough, if only by accident. However, on other systems, where they assume random values, this can be catastrophic (not to mention difficult to debug). Integer constants and expressions were also removed from subroutine calls. The INCLUDE files changed in INCS were:

DVMN — Changed declaration of function ACCESS to AKCESS to be consistent with VM name.

The programs changed in AIPPGM were:

AIPLAS — Declared J in subroutine PAGER.
DELSG — Corrected typo from IER to IERR in ENCODE statement.
FILAIP — Initialized N15.

The subroutines changed in AIPSUB were:

AU3A — Declared/initialized N15.

The programs changed in APLPGM were:

DISKU — ISIZE was being used where IWORK should have been.
PROFL — Declared function NBYPX.
XMOM — Declared variable IERR in subroutine XMOMDO.

The programs changed in APLSUB were:

FMATCH — Renamed dummy arguments N1 and N2 to NS and NL respectively. This is just to stop my source code integrity routines from reporting N1 and N2 as uninitialized N*n* variables.
GFINIS — Eliminated undeclared, unused but initialized variable TIMES.
MAPCR — Declared variable I.

The routines changed in APLDEA were:

YLUT — Declared and initialized N1.

Moved to 15JUL85 and 15OCT85 except as noted.

2678. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

The programs changed in NOTPGM included:

FILLR — Declared variable LREC.
GAPLT — In 15OCT85, only IERR was found to be undeclared. In 15JUL85 declared IERR and replaced calls to MSGWRT using integer constants with appropriately declared and initialized variables of the form N*n*.
GNMRG — Declared undeclared variables and replaced calls to MSGWRT using integer constants with appropriately declared and initialized variables of the form N*n*.
GNPLT — Replaced integer constants in calls to subroutines with appropriately declared and initialized variables of the form N*n*.
IMLHS — Declared variable NPARM.
IMMOD — Replaced integer constants in calls to subroutines with appropriately declared and initialized variables of the form N*n*.
NNLSQ — Declared all undeclared variables and functions as well as eliminated integer expressions in subroutine calls.

Moved to 15JUL85 and 15OCT85 except as noted.

2679. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

The programs changed in NOTPGM included:

- JMFIT — Declared all undeclared variables and replaced integer constant "1" in call to function DNRM2 with appropriately declared and initialized variable N1. Also removed IMPLICIT statements (these don't have an ANSI standard syntax and we already have to do enough preprocessing to choke a Cray) and explicitly declared all undeclared variables in the routines DVDMIN and DNRM2.
- NEWTB — Declared all undeclared variables and functions as well as eliminated integer expressions in subroutine calls.
- PBCOR — Declared all undeclared variables as well as functions IFPC and ARSIN.
- PLCUB — Declared all undeclared variables as well the function NBYPX. Undeclared variable GFIND was, of course, defaulting to REAL, however, it is passed to subroutines expecting INTEGER*2. In the subroutine FRAM, the variable INOI was misdeclared as INO1. These changes were made in 15JUL85 only. The 15OCT85 version has undergone extensive changes including all the above.
- POLCO — Major clean-up to a program that purported to be "almost standard". Declared all undeclared variables. Replaced integer constants and expressions in subroutine calls with properly declared and initialized/assigned INTEGER*2 variables. Replaced in-line comments with *AIPS* standard comments. Replaced comparison of REALs to CHARACTER constants with comparisons to properly declared REALs initialized with the appropriate hollerith data. Changed ENCODE into MSGXT to ENCODE into MSGTXT. Changed (IERR.EQ.0) to (IERR.EQ.O). This program might actually work on something besides a VAX now.
- PRTDR — Replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*.
- PRTGA — Declared all undeclared variables and replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*.
- PRTSD — Declared all undeclared variables as well as the functions IROUND and NBYPX.
- RGBMP — Declared all undeclared variables and replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*.
- RM — Declared all undeclared variables and replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*. Also changed statement labels that start in column 1 to start in column 2 (otherwise FITS source code transport programs screw up, but that's another problem).
- TASRT — Declared CATBLK(256) for use in /MAPHDR/ common.
- UVAVG — Declared all undeclared variables including PRGM(3) and removed integer expressions from subroutine calls.
- UVDGP — Declared all undeclared variables and changed N1 and N2 to I4N1 and I4N2 everywhere in subroutine UVDGIT.
- UVERR — Declared all undeclared variables and INCLUDE'd *ANT.INC in subroutine UVFHIS.
- UVFIL — Declared all undeclared variables and functions including IROUND and IFPC as well as BUFF2(256) and HISCRD(16,10) in subroutine GETUV (need to declare N8 and N3 in UVWIN).
- UVFIX — Declared function IROUND in subroutine UVWCAL.
- UVMOD — Declared all undeclared variables (many). Also changed variable N1 to IN1 everywhere in subroutine BESJ although it's only assigned an expression and never used for anything (sloppy).
- VBCAL — Declared all undeclared variables (*many*).
- VBCOR — Declared all undeclared variables (*many*).
- VBMRG — Declared all undeclared variables (*many*). Also replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*. Changed typo EQUVALENCE of CAT3 with CATBLKK to EQUIVALENCE with CATBLK in subroutine VMRGUV.
- VBPLT — Declared all undeclared variables (*many*). Also replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*. These changes were only made in 15JUL85. Whoever made the massive changes to 15OCT85 VBPLT was kind enough to have made sure that errors of the above type were corrected in the process.
- XXFIT — Declared all undeclared variables (*many*). Also replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*. Also, rearranged /GFTPM/ common block to eliminate alignment errors on machines that care about such things. Eliminated superfluous parentheses in several in-line DO loops in ENCODE statements that cause some compilers to interpret the I/O list as COMPLEX data.

Moved to 15JUL85 and 15OCT85 except as noted.

2680. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

The programs changed in NOTAPG were:

MX — Declared variable IERR in subroutine MXINIT, variable FFRAC in subroutine MXSEL and replaced "8" in call to MSGWRT with N8 in subroutine MXADD. Eliminated undeclared, initialized but unused variable P4TOR8.

STEER — Declared all undeclared variables and replaced integer constants in subroutine calls with properly declared and initialized INTEGER*2 variables of the form N*n*.

UVMAP — Declared all undeclared variables and functions. Also moved statement labels starting in column 1 to start in column 2 and changed undeclared variable SGTXT in subroutine UNIF to MSGTXT for ENCODE statement.

VM — Declared undeclared variables (only a few). More importantly, replaced integer constants in calls to the local function OPEN with properly declared and initialized INTEGER*2 variables of the form N*n*. Also replaced integer constant 256 in calls to COPY with N256 (initialized to 256, of course) within subroutine FILES. These simple changes made VM work on the CONVEX C-1 and the CV IBM under UTS. Also changed the name of the function ACCESS to AKCESS since ACCESS is a Fortran callable system verb under COS and VM. Otherwise, VM won't work on the VP Cray (as Bob Duquet discovered). We should probably consider similarly renaming the functions OPEN and CLOSE. Also changed DVMN.INC and CVMN.INC.

CALCOP — INCLUDE'd *HDR.INC in 15JUL85 only; already changed in 15OCT85 by someone else.

CHNDAT — Declared variable NIF.

DATGET — Declared variables IUBIND, NO and initialized NO.

DPRE — Explicitly declared all variables (removed IMPLICIT REAL*8 statement).

GAINI — Declared variables GN and J. GN was, of course, defaulting to REAL. However, it is passed as an argument to TABINI containing hollerith character data to an INTEGER*2 receiving argument. Also corrected typo referring to NUMMOD instead of NUMNOD.

ITBSRT — Declared variables LENBU, KEY1, KEY2, KKEY, and KOUT.

NXTFLG — Declared dummy argument TIME.

TABGA — Declared dummy arguments TIME and TIMEI.

TABKEY — Declared dummy arguments COUNT and OPCODE.

TABSRT — Declared variables and replaced integer constant in subroutine call with properly declared and initialized INTEGER*2 variable of the form N*n*.

UVGET — Declared and initialized NO.

UVGRID — Changed portion of arithmetic IF from (ABS (BUFF1 (JNPRT+1) .LT. VVMAX)) to (ABS (BUFF1 (JNPRT+1)) .LT. VVMAX). Apparently the VAX is quite willing to let you take the absolute value of a logical expression and merely assumes you know what you're doing whereas the "deficient" compilers of other systems get upset.

The programs changed in APLMC4 were:

ZDELAY — Initialized NO. NO is actually assigned "0" in the body of this routine, however, data initialization doesn't hurt anything and I'm tired of rediscovering that all is okay when my source code integrity routines report this as an error.

ZDOPRT — Changed CALL MSGWRT (7) to CALL MSGWRT (N7).

ZEXPND — Declared and initialized N7 for use in MSGWRT.

ZRENAM — Changed CALL MSGWRT (6) to CALL MSGWRT (N6).

The programs changed in APLVMS were:

ZLDFIL — Replaced calls to subroutines containing integer constants with properly declared and initialized INTEGER*2 variables of the form N*n*. Actually this is a defunct routine just like one of the routines it calls (ZB2ASC) but I'm tired of my source code integrity routines reporting its errors. We should delete all such defunct Z-routines. Otherwise, when *AIPS* is ported to 15JUL85 machines, people can waste time developing these routines under the impression that if they appear in the VMS Z-routine directory, then certainly they must be called by somebody (*e.g.*, Bob Duquet and ZB2ASC in the case of the COS port).

The programs changed in NOTVMS were:

ZQWKPR — Replaced calls to MSGWRT containing integer constants with properly declared and initialized INTEGER*2 variables of the form N*n*.

Moved to 15JUL85 and 15OCT85 except as noted.

2681. *July 8, 1985* Undeclared/Mis-declared/Uninitialized *Kerry*

The programs changed in SAPSUB were:

TESTR — Declared undeclared variables (I know this is just a test program but I'm tired of my source code integrity routines reporting a problem with it).

The programs changed in [.AIPS.ZPGM.MC4] were:

ZSTRTA — Initialized variable N4 (used in call to FILL).

The programs changed in AIPVMS were:

ZACTV8 — Declared N2.

Except where noted, all changes were made in both 15OCT85 and 15JUL85 on the same date. All changes to 15JUL85 were moved to UNIX and the VP Cray July 9, 1985.

2682. *July 9, 1985* GEOM, PGEOM, HGEOM *Thad*

The calling sequences in the LINPACK subroutines were fixed. In GEOM, some expressions were replaced by variable names and constants were replaced by initialized variables. Also, function arguments which served as array dimensions were changed from I*2 to INTEGER. The offending routines in PGEOM and HGEOM were not being called so they were deleted. In addition, some I*2 variables (work space pointers) in HGEOM were changed to I*4 to avoid integer overflow.

GEOM and PGEOM moved to 15JUL85 this date, HGEOM moved nowhere.

2683. *July 9, 1985* VM *Tim*

Added from CHKOUT history by Editors: "new feature" and "more lies."

Moved nowhere.

2684. *July 11, 1985* POPSGN *Kerry*

Changed the dimension of the REAL array VERSON from 5 to 12. Also changed the FORMAT statement involving user input for VERSON.

Moved to 15JUL85 same date.

2685. *July 11, 1985* UVLOD *Gary*

Added from CHKOUT history by Editors: "tables."

Moved nowhere.

2686. *July 11, 1985* ZDIR *Gary*

Added from CHKOUT history by Editors: "bug — DATAed variable is changed."

Moved nowhere.

2687. *July 12, 1985* ASCAL *Fred*

In the gain solution routines, GCALC and GCALC1, I tightened the tests for convergence, by increasing the maximum allowable number of iterations, ITMAX, from 30 and 40 to 60 (in both routines) and by decreasing the convergence parameter, TOL (a test on the largest relative change in any of the complex gains — from one iteration to the next), from 5×10^{-3} to 5×10^{-6}. This is a stricter convergence test than would be necessary in most cases, and it will slow the program a little bit. However, it's better to be safe than sorry. In investigating closure errors, it's necessary to have such a strict convergence test if one is interested in distinguishing amplitude closure errors of the order of $\approx$ a few one-hundredths of a percent (it might possibly be important at the $\approx 0.1\%$ level — I'm not certain — and this is the real reason for the change). (But the old convergence test seems to have been adequate for phase closure error evaluations at as little as the 0.01° level.)

In order to get the program to compile with the new NAPCLNK procedure, I had to insert a bit of INTEGER*2 silliness: In the I*2 declaration in the subroutine FLAG, I had to make the declaration of NV precede that of the (adjustable) array declaration I1(NV), in order to satisfy the VMS compiler. (Both things already were explicitly declared, but the compiler failed to look ahead to the declaration for NV.) And in the subroutine SCLMOD (which is *not* so-called "Fredcode") the variable IERR hadn't appeared in a type declaration statement.

Moved nowhere.

2688. *July 12, 1985* TV by wire (1) *Eric*

The Cray does not have a TV device directly connected to it. Instead, it must communicate to some other computer which does have such a device. This computer may be the VP VAX, but there should be no strong reason why it could not be some other CPU down some communications link. To test this concept, I have developed a new set of Y routines which effectively bundle the call arguments into a machine-independent form (FITS characters and 16-bit integers) and send them over the "wire" and a program to run at the other end to unbundle the arguments into that CPU's local characters, integers, and floating values and call the Y routine library appropriate to the TV device actually attached to the CPU. The new Y routines will be known by the letters VTV (virtual TV) and use new includes DVTV.INC and CVTV.INC.
Moved nowhere.

2689. *July 12, 1985* TV by wire (2) *Eric*

Since the TV is shared by both remote and local CPUs, the image catalog must be maintained on the CPU which is connected to the TV device. Thus, the image catalog routines must become Y routines. Done for M70, M75, DEA, and NUN were:

YCINIT — Just a renamed copy of ICINIT with ZFI3 changed to ZFIO.
YCREAD — Just a renamed copy of ICREAD with ZFI3 changed to ZFIO.
YCWRIT — Just a renamed copy of ICWRIT with ZFI3 changed to ZFIO.
YCOVER — Just a renamed copy of ICOVER with ZFI3 changed to ZFIO.
YLOCAT — Just a renamed copy of TVLOCA with ZFI3 changed to ZFIO.

Also changed TVFIND into two routines: YFIND to do the detailed image catalog work and TVFIND to handle the error conditions including asking the user to point at the desired image when necessary. Deleted ICINIT, ICREAD, ICWRIT, ICOVER and TVLOCA.
Moved nowhere.

2690. *July 12, 1985* TV by wire (3) *Eric*

The following routines were deleted since they have been replaced: ICINIT, ICREAD, ICWRIT, ICOVER, and TVLOCA. Changed to call the new routines were:

AU5	AU5C	AU5D	AU6A	AU6B	AU9A	AU9B
IAXIS1	SLOCIN	TVLOAD	FILAI2	FILAIP	FILINI	APCLN
BLANK	BLSUM	TKPL	TVPL	XBASL	XGAUS	XPLOT
APGS	APMAP	APVC	MX	STEER	UVDIS	UVMAP
VM	TVHLD	TVSLV				

Also changed DEA, IIS, and M75 versions of YINIT and YCUCOR.
Moved nowhere.

2691. *July 12, 1985* Fix up messes *Eric*

Problems with declarations:

APGS — (61 diagnostics!) declared all variables which were not declared — several minor errors were uncovered including one that would mess up the header in the units area.
APVC — (63 diagnostics!) declared all variables which were not declared — several minor errors were uncovered including one that would mess up the header in the units area. Also fixed all MSGWRT calls.
TVHLD — Corrected 4 undeclared variables, one of which was supposed to be a 256-word buffer.
TVSLV — Corrected 2 undeclared variables and one undeclared function.

UVDIS with 203 diagnostics and APMAP with 419 diagnostics are just not worth the trouble.
Moved nowhere.

2692. *July 12, 1985* FILAIP *Eric*

It does not make sense to create a 0-byte file — changed the creation of TA files to 512 bytes in FILAI2 and FILAIP.
Moved nowhere.

2693. *July 16, 1985* ZDCHIN *Eric*

Changed VMS versions of ZDCHIN in 15OCT85 and 15JUL85 for an error: an RCOPY rather than an RFILL was used in the initial parameter setting. The bug should not cause harm since the parameters are actually coming from disk.
Moved as above, nowhere else.

2694. *July 16, 1985* CONVRT, ZQMSG *Don*

CONVRT changes from floating to fixed format by renaming its input file and then copying back to a new file with the old name. This worked fine as long as the desired name for the rename didn't already exist; if it did, the old CONVRT would crash with a rather mysterious VMS error message. The revised CONVRT first attempts to destroy the desired name and then tries again to perform the rename operation. The need for this procedure arises if a task is aborted for any reason while in the midst of executing the CONVRT subroutine.
In the course of tracking down the cause of the error I decided that the hexadecimal error code printed by ZQMSG was really not user-friendly, especially considering that the call to the error message retrieval system service includes an argument to select the nice ASCII codes which are the sort keys for the VMS System Messages book (Volume 8).
Moved nowhere.

Changes: 15-Jul-1985 version of *AIPS*

This section is intended normally to provide corrections and updates to the *AIPS COOKBOOK* in order to fill the gap between publication dates. A complete new *COOKBOOK* is under preparation and thus updates are not necessary at this time. The new edition will be labeled as a 15 October 1985 version, but should apply almost as well to the current 15JUL85 release.

AIPS Workshop Preregistration

1. **Your name, address, and phone number:** _____

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2. **I wish to be notified of Workshop plans:** ☐ Yes ☐ No

3. **I plan to attend:** ☐ Yes ☐ No ☐ Maybe

4. **I will need a motel reservation:** ☐ Yes ☐ No

5. **Suggested topics:** _____

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6. **I wish to present a paper on:** _____

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   (Shipped ≈ 1 week after release date) ☐ 15-Oct-1985

4. Tape type desired:
   (VMS only) . . . . . ☐ VAX/VMS BACKUP
   VAX load modules desired: ☐ Yes ☐ No
   (requires 2nd 1600 bpi tape)
   (UNIX only) . . . . . ☐ UNIX tar
   Version of UNIX system in use: _____
   N.B. we need to know this. *e.g.*, bsd4.*x*, Sys III, Sys V, V7, *etc.*
   (Neither UNIX nor VMS) . . . . . ☐ Simple blocked card images
   ☐ FITS compressed text format
   Version of Z routines desired: ☐ VAX/VMS ☐ ModComp ☐ UNIX

5. Tape density desired: . . . . . ☐ 800 bpi ☐ 1600 bpi ☐ 6250 bpi

6. There are gripes on (returned) tape: . . . ☐ Yes ☐ No

7. Printed documents requested: . . . . . ☐ 15OCT85 *COOKBOOK*
   ☐ 15JUL85 *GOING AIPS* Vol 1
   ☐ 15JUL85 *GOING AIPS* Vol 2
   ☐ *AIPS* Memo No. 36
   ☐ *AIPS* Memo No. 37

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July 15, 1985

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A I P S L E T T E R

Volume V, Number 4: October 15, 1985

National Radio Astronomy Observatory

A newsletter for users of the
*A*stronomical *I*mage *P*rocessing *S*ystem

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News Notes

We need your advice! Among several ideas for simplifying the coding of *AIPS* routines is a proposal to switch to floating-point maps exclusively. On most systems, this would increase the disk storage requirements substantially. At NRAO, this change would increase our *AIPS*-data disk storage needs by about 10–30% (the measurements on October 24 were 11% on VAX3, 19% on CVAX and 27% on AIPS). The payoff would be simpler coding, faster program execution (no need to move and float input or do an extra pass through the output to scale it to integer), and more accurate representation of high dynamic range images (60,000 to 1 is the absolute limit of integer images). We are likely to make this change unless there is a serious outcry against it from non-NRAO sites. Please send us your view on this proposal *now*, if your site would be seriously affected by it. To assist you in replying, we have added to the *AIPSLETTER* masthead NRAO's TWX number and two network pathways for computer mail.

By the time you read this, the *AIPS* Workshop will have taken place. It is scheduled for Thursday October 31 and Friday November 1 in Charlottesville and 25 people from outside Charlottesville have indicated their intention to attend. We will report interesting results from the Workshop in the next issue of the *AIPSLETTER*.

Benchmark testing for the Charlottesville IBM replacement computer procurement has been completed. Three systems were qualified for the procurement using the *AIPS* PFT certification and benchmarking package: DEC VAX-8600, Convex C-1, and Alliant FX/*n*. The test results show that the latter two systems are clearly superior in performance to the 8600. Both the Alliant and the Convex systems make fine *AIPS* machines, and the *AIPS* Group recommends both of them to any group which wants a high-performance *AIPS* computer based on state-of-the-art technology. The two systems were judged to be roughly equal on overall technical grounds *at this particular date and for this particular procurement,* so our final procurement decision will likely depend on issues other than performance alone. For more of the technical details, see further notes in the Portability column and *AIPS* Memo No. 38 whose abstract is reproduced on page 4 of

this *AIPSLETTER*. Regardless of which of the two vendors is selected for NRAO's procurement, the *AIPS* group stands ready to assist any *AIPS* site which subsequently chooses either vendor. We also recognize that NRAO's evaluation may become obsolete as the relative price, performance, and features of these relatively new machines evolve in the coming months.

Summary of Changes: 15 July 1985 — 15 October 1985

These changes are listed in detail in the CHANGE.DOC files reproduced later in the *AIPSLETTER*. In this quarter, we have again concentrated more on long-term projects than on short-term improvements. Nonetheless, there are 28 changes to 15OCT85 as NEW and 79 changes to 15JAN86 as TST listed in the CHANGE.DOC files.

Changes of Interest to Users: 15OCT85 as NEW

Changes to the NEW area are normally restricted to bug fixes, but minor improvements are sometimes made as well. Among these, in this quarter, were a change to the plot routines to include the leading sign whenever the next digits are plotted (see entry 2695) and new options in VBPLT for plotting the real or imaginary parts of the visibility. The TV blink verbs were also changed to make them easier to use (see entry 2714 below for details). The general help files were brought up to date and the help files for COMB and EGETNAME were significantly improved.

During the quarter, some significant bugs were corrected as in-house exercising of *AIPS* detected them. A technical error caused UVMAP to fail when trying to map line data. DBCON had the habit of declaring data sets incompatible when they should have been acceptable. CCMOD had lost track of its name and the type of file it required. POLCO failed on rectangular images and IMEAN failed to handle the history file and top (date) line correctly when plotting histograms. COPY did not know about the new files which hold the image headers. Image selection failed when more than one image was visible on the TV and slice files could not be read correctly by TKSLICE and SLFIT.

Changes of Interest to Users: 15JAN86 as TST

All the changes mentioned above were also made in the 15JAN86 version. In fact, only a few bugs were corrected solely in the TST area. Two new tasks appeared: XPORT which is used for communicating images between computers and IMFLT which fits and subtracts a planar background from an image.

A number of significant improvements were made which are of interest to users. UVFLG was made more flexible and general (see entry 2778 below and the help file for details). MX was changed to do a full computation of the histogram when restarting and to allow spectral channels to be flagged individually. The latter change has interesting possibilities for the combination of data from different configurations (see entry 2734). VM was corrected and improved to run faster on more computers and was changed to accept either integer or floating input images and to write the ouput image in floating format. The tape-handling routines, IMLOD, UVLOD and FITTP, were improved in their handling of table files and received a variety of other corrections and improvements (see entry 2791). MCUBE was revised to create n-dimensional images from either n- or $(n-1)$-dimensional input images with n as small as 1. It can even extend the highest real axis of a single input image. MOMNT was changed to handle history files, to use correct units, and to provide defaults and more intelligible error messages. SMOTH was also changed to handle history files. The *POPS* language processor was improved to emit an error message when the use of one of the special pseudoverbs causes other text on the input line to be ignored. (These special pseudoverbs must occur as the only command on a line and include such things as GET, RESTORE, EDIT, MODIFY and RUN.) The verb MAXFIT was changed to accept failures without setting an error flag and the task TOVLB was cleaned up and given several new options.

Changes of Interest to Programmers: 15OCT85 as NEW

The need for careful coding was re-emphasized by Fujitsu when they installed *AIPS* on one of their computers. Programmers should study the list of errors corrected as a result of their detailed report (see entry 2754 for all the details). A new set of Y routines has been installed in *AIPS*. These are for a Comtal Vision 1/20 and were provided by Andy Lubenow then of the University of Illinois (see 2766 for the details). If you have such a TV, we will need your help in keeping these routines free of bugs. The intertask communication was revised in a minor way yet again (see 2696). PRTACC was corrected to handle large accounting files and the new *COOKBOOK* was released as tex files in the DOCPUBL: area.

Changes of Interest to Programmers: 15JAN86 as TST

The 15JAN86 release of *AIPS* has a new directory structure and new procedures for VAXes and will probably have them for UNIX systems as well by the time it is released. The changes will be described in an *AIPS* Memo since they are too complicated to be described here (see entry 2758). The new structure is more detailed and much more hierarchal than before and will assist us in implementing shared load modules and in supporting a variety of vector and display devices. The new procedure library takes advantage of logical name tables and concealed device logical names which appeared with revision 4.0 of VMS. Sites using earlier revisions of VMS should either upgrade their systems now or order the 15OCT85 release and then wait until they upgrade their systems before ordering a later release.

Under cover of the directory change, we also changed the physical names of *AIPS* files. The disk number character has been replaced with a file format ID character (currently A). This change will allow disk packs to be moved to different disk drives and will allow several *AIPS* releases to exist in the same data area. A stand-alone utility program, UPDAT, was written to perform this format change. We anticipate adding future format changes to UPDAT as well and having the program be capable of performing more than one format revision in a single execution (see 2761). If a user's catalog file (type CA) is damaged, the revitalized utility program RECAT should be able to correct the situation (see 2783).

Several sets of utility subroutines were installed this quarter. Two alternative input parsers, one for terminal I/O and one for text files in the RUN area, appeared (see 2762 and 2779). Selection routines for *uv* data were improved (see 2734 and 2735) and new calibration utilities were written (see 2780). The Image Storage Unit attached to one of NRAO's I^2S TV displays is now partially supported by *AIPS* code. In the absence of such a unit, the parameter ISUNUM should be set to zero (see 2731 and 2740). Finally, the text files for *Going AIPS* were put back in the DOCTXT: area.

AIPS Publications

The Order Form at the end of this *AIPSLETTER* may be used to order the following memoranda and books. All previous memoranda are also available. At the moment, we are out of copies of *Going AIPS* and it is being reprinted in Green Bank. The 15OCT85 *COOKBOOK* has been completed and is being printed in Green Bank. New memos are described below. The Wishlist one is available at present, but the others are not yet complete. The *AIPS* Memo No. 37 on the Convex tests, promised in the last *AIPSLETTER*, was withdrawn to allow us to do additional testing. Those of you who requested it on the 15-July Order Form will be sent the revised version, now called Memo No. 38, when it becomes available. There is no need to reorder.

AIPS COOKBOOK, Alan H. Bridle and Eric W. Greisen, eds, October 1985.

The *AIPS COOKBOOK* is the basic guide for users of the Astronomical Image Processing System. It begins with detailed, step-by-step instructions for the beginning user and then treats a few more advanced topics. An index to all *AIPS* software, a glossary of astronomical image processing terms, and guides to using NRAO's *AIPS* equipment complete the book. This third typeset edition has been corrected for all changes in the *AIPS* package through the 15OCT85 release. The chapters on image making and deconvolution were rewritten to describe the program MX and to give additional guidance on running ASCAL, the chapter on spectral-line processing was completely rewritten, and a new chapter on VLBI-specific processing was added. Samples of several display algorithms and a number of new recipes have also been added.

AIPS Memo No. 37: "The *AIPS* Wishlist," Eric W. Greisen, 27 August 1985.

The informal "wishlist" maintained by the *AIPS* group has been converted to a document for ongoing discussion of *AIPS* development priorities. The items are listed in the categories of (1) general maintenance; (2) projects in progress; (3) system improvements; (4) tasks; (5) miscellaneous; and (6) other. There is a general, but not specific, ordering by priority and some indication of who will do the work and what the chances are for the item to be done in the next year. Memo No. 37 is an updated version of Memo No. 34 with additions and deletions made during the past six months.

AIPS Memo No. 38: "Certification and Benchmarking of *AIPS* on the Convex C-1 and Alliant FX/8," Kerry C. Hilldrup, Donald C. Wells, William D. Cotton, November 1985.

The 15APR85 release of *AIPS* has been installed on the Convex C-1 vector computer and on the Alliant FX/8 vector/concurrent computer. Both have been certified using the PFT benchmarking and certification test. Although a small number of compiler bugs were encountered in each, the *AIPS* application code was installed with only minimal modifications, and computed results agreed well with other implementations of *AIPS*. In the course of the implementations, the technology of the Clark CLEAN algorithm was advanced considerably; the final vectorized CLEAN algorithm on both systems is about three times as fast as the current microcode algorithm on the FPS AP-120B array processor. Similar improvements were observed on other highly vectorized tasks. Programs which were not vectorized generally executed on both in comparable CPU times and faster real times than they achieved on the DEC VAX-8600. The FX/8 with 6 computational elements (CEs) generally outperformed the C-1 by a little in CPU time, but was significantly slower in real time. The performance of the FX/8 as a function of the number of CEs is also described.

AIPS Memo No. 39: "Shareable Images for *AIPS* under VMS," Pat Moore, Gary A. Fickling, November 1985.

This memo describes a proposed implementation of *AIPS* using shareable images under VMS. Included in this proposal are some changes to the *AIPS* directory structure which have already been implemented in the 15JAN86 release. These changes not only facilitate building shareable images, but tidy up the directory structure for all *AIPS* environments. Shareable images have numerous advantages, among which are that they conserve disk space and physical memory, they may be maintained and installed more easily, and they allow support for multiple devices (*i.e.*, different types of TV display systems on the same computer). The new directory structure provides some of these advantages already. The second part of this memo describes for programmers the details of the current implementation.

The Portability Column

CPU/OS Combinations

Cray X/MP+COS: The COS 1.14 implementation of *AIPS* on the Vector Production X-MP was upgraded to the 15JUL85 release, and passed the certification test. For CPU-limited tasks, the X-MP is 15-50 times faster than the VAX 780+AP, and 6-12 times faster than the Alliant FX/8 and Convex C-1 which are discussed below; some further improvement is expected. These speed ratios are Cray *CPU*-time compared to *real*-time for the other systems, because the Vector Production X-MP currently lacks an SSD (Solid-state Storage Device) and its real-time performance is a poor indicator of its intrinsic capabilities. The *AIPS* version of the task VM now exhibits CPU-times similar to those for the Cray stand-alone version of VM developed by Tim Cornwell and Bob Duquet over the past year (see the 1 July issue of the NRAO Newsletter for more discussion about VM on the Cray).

Convex Computer Corporation C-1+UNIX: The Convex C-1 is a vector computer which was reviewed in the 15JAN85 and 15JUL85 *AIPSLETTER*s. NRAO installed *AIPS* on the C-1 during May and June to evaluate its suitability for the upcoming Charlottesville procurement. Soon after the 15JUL85 newsletter went to press, it became obvious that the Alliant FX/8 was also a viable competitor for the procurement, and that the C-1 and FX/8 would have to be tested in a controlled experiment. Late in August, minor improvements were made in the Convex installation, and it was retested during the first two weeks of September.

A notable change in the C-1 between June and September was the introduction of "striped" disks. For *AIPS* tasks which are I/O-limited, the C-1, which used four-way-striped "Eagle" disks without asynchronous I/O, demonstrated real-time performance about three times better than did the VAX 8600, which used an unstriped RA-81 disk with asynchronous I/O (Convex expects to support asynchronous I/O as well in its next O/S release). After the last few compiler bugs were found, the September version of the Convex compiler was able to compile essentially *all* of *AIPS* with the highest level of optimization enabled. Finally, the machine tested in September had a 9.5 MHz clock (the June machine was 9.0; Convex expects to deliver 10.0 MHz machines in the near future). For a detailed performance evaluation, see *AIPS* Memo No. 38.

Convex Computer Corporation may be contacted in Richardson, TX at (214) 669–3700. Prices for C-1 systems range upward from about $500K. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it except for the fact that AIPS will run on it.*

Alliant Computer Systems Corp. FX/8+UNIX: On July 23, Alliant announced a new line of computers containing from 1 to 8 "computational elements" (CEs), each of which is both a scalar and vector computer approximately equal in power to a VAX 8600 plus AP-120B array processor. An FX/8 system with 8 CEs has a peak performance rating for 32-bit data of about 35 Mips for scalar operations and 94 MFlops for vector-concurrent computing. The floating point notation is IEEE, and the scalar instruction set is a gate-array implementation of the Motorola 68020 architecture, with vector register and concurrency instructions added. Up to twelve 68012 computers are used as "interactive processors" (IPs) and peripheral controllers. The FX/8 operating system manages queues for the 8 CEs and 12 IPs; it is derived from 4.2bsd UNIX, and supports the TCP/IP network protocol. Alliant has a Fortran compiler which automatically generates code to exploit the vector and concurrent architecture; concurrent code automatically utilizes as many CEs as are available. This compiler represents a major breakthrough in compiler technology; it is the *first* commercially available Fortran compiler which supports parallel execution. The compiler accepts most VMS Fortran extensions, and even supports the proposed vector-notation extensions of Fortran 8*x*.

NRAO installed *AIPS* on an FX/8 at the Alliant factory in Acton, MA during August. Alliant currently does not support calling C procedures from Fortran; consequently it was necessary to develop Z-routines which make Fortran-style calls to the UNIX system services. A few compiler bugs were encountered and soon fixed. Essentially *all* of *AIPS* was then compiled with the optimizer fully enabled.

Alliant currently supports neither disk striping nor asynchronous I/O. For tasks which are I/O-limited, the Alliant yielded real time performance similar to, or slightly better than, that of the VAX 8600 under VMS. For tasks which are CPU-limited, an Alliant with 6 CEs proved to be generally somewhat faster in CPU time than the Convex C-1. For a detailed discussion of the performance as a function of the number of CEs, consult *AIPS* Memo No. 38.

NRAO's measurements show that an Alliant with only *one* CE (an "FX/1") is slightly faster than a VAX 780 with FPS array processor for CPU-limited tasks, and comparable to the VAX 8600 for I/O-limited tasks. Therefore, it seems likely that the FX/1 will exhibit performance for *AIPS* purposes comparable to, or slightly better than, a VAX 8600+AP, but at significantly lower costs. Any *AIPS* site contemplating the procurement of an *AIPS* system should consider the Alliant FX/1; the power of its vectorizing compiler and vector register hardware for general scientific computing is an additional strong reason for considering this computer for *AIPS* procurements.

Prices for the FX/1 start below \$150K; FX/n prices range from about \$270K to about \$950K. Alliant Computer Systems Corp. may be contacted at (617) 263-9110 in Acton, MA. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it, except for the fact that AIPS will run on it.*

Product Reviews

Anticipated computer announcements: NRAO is aware of four more vendors who are developing vector/parallel systems with performance comparable to the Convex and Alliant machines. A series of new product announcements from these vendors can be expected over the next 3-12 months. *AIPS* sites who are contemplating near-term procurements can call Don Wells for information.

FPS 164/264/364 array processors: On 14 August, two representatives of Floating Point Systems gave a presentation in Charlottesville on their 264 model. The 264 has the same architecture as the older 164, which is analogous, *although not identical,* to the even older 120B (now called the 5205), which is the AP that many *AIPS* systems use. The principal architectural differences are that the address space is 24-bits rather than 16, and the floating point word size is 64-bits rather than 38. These differences mean that NRAO's custom 120B microcode, such as B. Clark's CLEAN, would not execute immediately on the 64-bit architecture, although the conversion might not be difficult. FPS refers to 164/264/364 systems as "scientific computers." Even though they have a Fortran compiler and an operating system called "SJE," it is still true that they require the presence of a host machine, usually a VAX under VMS, to function properly. SJE supports high performance disk drives, with a "flat" directory structure.

The compiler capability enables entire Fortran programs to be compiled and linked to run under SJE. Conceivably this could permit *AIPS* tasks to be run under SJE; however, substantial problems with background/foreground execution, host/AP data format differences, language incompatibilities, and I/O operations would need to be overcome to make this a reality. The older style of AP usage employed with 120Bs is still possible with the *X*64 machines (using the "APEX64" executive), and should be relatively easy to implement once the microcode conversion difficulties are surmounted.

The 264 executes at 19 MHz, which leads to a 38 MFlop capability (adder plus multiplier), as compared to 6 MHz and 12 MFlops for both the old 120B and the 164. Recently FPS announced their model 364, which has a 5.5 MHz clock and 11 MFlop capability. Because the clock frequencies are identical, there is little reason to expect that the 164 or 364 would be significantly faster than the 120B for *AIPS* operations. Although in 64-bit linear algebra benchmarks the 264 exhibits performance superior to both the Convex and Alliant computers discussed previously, it is not obvious that the advantage would hold for the 32-bit computations and synthesis algorithms of *AIPS*. *Please note that our mentioning of the availability of this product does not constitute any sort of endorsement of it. Also, this review is based on our current understanding of these complex and evolving systems.*

CHANGE.DOC: 15OCT85 Version as NEW

2695. *July 19, 1985* Tick labels *Eric*

Changed CTICS, TKTICS, ITICS to display the left-most digit (usually the sign for declination) whenever the next digits change (usually hours or degrees).
Moved from 15JAN86 this date.

2696. *July 19, 1985* Task communication *Eric*

The Cray has some trouble telling if a task is currently queued to run but has not yet started. Changed the algorithm for waiting on task start-up and resumption by adding a loop at the beginning to wait until the task signals that it has begun (by clearing its name from the TD file). The loop is executed no more than 100 times with a calling program specified time delay. I wrote a new subroutine TASKWT to implement the whole algorithm and revised AU2 (verb GO), QMNGR, and AIPSC to call TASKWT rather than doing the algorithm themselves.
Moved from 15JAN86 this date, to VP Cray a week previous.

2697. *July 23, 1985* UVMAP *Pat*

The variable FFRAC in routine CONGRD had been incorrectly declared as type INTEGER*2 instead of REAL*4. This was causing spectral line mode to fail completely. Continuum mode may also be suspect.
Moved from 15JAN86 this date.

2698. *August 3, 1985* GRDAT (CRAY change) *Bill*

Removed index from BUFF1 in call to CATIO.
Moved from CRAY this date, to 15JAN86 8/1/85.

2699. *August 3, 1985* ASCAL (CRAY change) *Bill/Kerry*

Increased size of common buffer RBUF from 2500 to 4096 R*4 words both in DCAL.INC and in setting JBUFSZ in SCLFND and VISCOR. In VISCOR, fixed equivalence of RBUF with IBUF and OBUF. In SCLMOD, changed to use RBUF instead of BUFF3. In SOLVE, changed to use all of RBUF (*i.e.*, JBUFSZ*2).
Moved from CRAY this date, to 15JAN86 8/1/85.

2700. *August 7, 1985* COMB, TV *Eric*

Corrected the help file description of the CLIP operation. Added a time delay after the master clear for I^2S Model 70 in YTVMC to allow the ISU program to recover.
Moved from 15JAN86 this date, nowhere else.

2701. *August 13, 1985* SETTVP *Eric*

Variables F and ONE were misordered in the DATA statement leading to incorrect values. Why don't VAXes complain about bad types?
Correction moved from 15JAN86, nowhere else.

2702. *August 13, 1985* EGETNAME *Eric*

In working on the *COOKBOOK*, I discovered that the help files for EGETNAME and GETNAME were identical. Added stuff to the one for EGETNAME to describe the differences.
Moved from 15JAN86, nowhere else.

2703. *August 15, 1985* BATER *Eric*

Added by Editors from CHKOUT *history:* Fixed the SUBMIT verb to use the new task communication routines.
Moved to 15OCT85, nowhere else.

2704. *August 16, 1985* COPY *Pat*

The changes to catalogue files had broken the COPY program. It now supports the new CB file structure.
Moved to 15OCT85 and VLA this date.

2705. *August 20, 1985* General help files *Eric*

Updated and corrected the general help files: ANALYSIS, APTASKS, CATINFO, GENERAL, INDEX, MAPETC, PL2D, POPSYM, TAPU, TVGEN, UVPR, and VLBI.
Moved from 15JAN86, nowhere else.

2706. *August 23, 1985* UVFIT *Bill*

The default antenna gain was the antenna number; this leads to exceedingly poor behavior and bad answers if it ever did converge. Defaults are now 1.0
Moved from 15JAN86 this date, nowhere else.

2707. *August 23, 1985* POLCO *Neil*

The number of rows and number of columns were back to front. Therefore, the program failed on non-square images.
Moved from 15JAN86 this date.

2708. *August 26, 1985* VBPLT *Bill*

Numerous small fixes. Now correctly handles size of uniform spheres (in the old version nothing appeared resolved). Also, VBPLT will now plot models for REAL and IMAGinary parts. Logic in REEDIN to detect the model type was inverted so all components were considered point components.
Moved to 15JAN86 this date.

2709. *September 4, 1985* PRTACC *Eric*

Changed to make more of the counters INTEGER*4 to handle large accounting files and to call QMNGR an "AIPS" program.
Moved from 15JAN86, nowhere else.

2710. *September 4, 1985* DOALIGN *Eric*

Corrected DOALIGN computations to use double precision throughout in the tasks BLANK, BLSUM, COMB, CORMS, GREYS, and PCNTR.
Moved from 15JAN86, nowhere else.

2711. *September 5, 1985* Slices *Eric*

The removal of INTYPE from the inputs to SLICE had a ripple effect. Corrected TKSLIN to pick up the correct corners. Corrected SLFIT to pick up correct corners and to use ZFIO rather than ZFI3.
Moved from 15JAN86, nowhere else.

2712. *September 16, 1985* Misc bugs *Fujitsu/Eric*

In installing *AIPS* on a Fujitsu, several non-standard Fortran constructs were discovered and reported. Fujitsu provided a detailed, 63-page report with the "wish that having this report *AIPS* would grow up with much portability." The problems were corrected in both 15OCT85 and 15JAN86 versions except that I did not attempt in 15OCT85 to declare all the variables. This was (mostly) done in 15JAN86. A full report on the corrections is made in the 15JAN86 version of CHANGE.DOC. The routines affected were HICOPY, APCLN, MX, IMFIT, VBCIT, SMOTH, VBPLT, AVTP, DTTIME, TVSLD, TVSLV, TOVLB, BCAL1, VBFIT, VSCAL and EFU2.INC.
Moved from 15JAN86, nowhere else.

2713. *September 16, 1985* UVGRID *Eric*

Changed message level of data mis-sorted message from 1 to 6 in order to have it recorded in the message file.
Moved from 15JAN86, nowhere else.

2714. *September 19, 1985* TV blinking *Eric*

While working on the Comtal routines, I checked all the code which uses split screen since that function is not available in the Comtal Y routines. I found that the blink function was not prepared to deal with such a case. Changed AU6A, TVBLNK and the help files for TVBLINK and TVMBLINK to handle the absence of split screens and to modify the meaning of button C in both verbs and button B in TVMBLINK. Now, both images will be enhanced simultaneously on button C (in blink mode) for TVBLINK and TVMBLINK. Button B in TVMBLINK selects autoblinking.

Moved from 15JAN86, nowhere else.

2715. *September 19, 1985* COMTAL Y *Eric*

A set of routines to support a Comtal 1/20 TV display device was submitted by Andy Lubenow quite some time ago. I finally got around to checking them over and putting them into the system. They were installed in both 15OCT85 and 15JAN86 and are reported fully in the latter version of CHANGE.DOC.

Moved from 15JAN86, nowhere else.

2716. *September 24, 1985* More bugs *Eric*

Corrected:

ISCALE — to load 0 for blanked pixels in LG and NG transfers.
YFIND — (YGEN:) to branch out correctly when it finds more than 1 image.
TVFIND — to return no error when YFIND finds more than 1 image and the user correctly selects one.
NINER — to select the correct filter array — it was off by one for the preset linear filters.
COMLAB — to reduce the length of the name string at the top by one.
QMSPL — to prevent the left hand label from being lost and to drop unused YTVCIN call.
PLROW — to check for blanked rows when scaling the plot.

Moved from 15JAN86, nowhere else.

2717. *October 2, 1985* OTBSRT, CCMOD *Eric/Kerry/Imke*

Corrected variable name FIND should have been IND on the file close call in OTBSRT. Corrected task name and CC file type strings in CCMOD.

Moved from 15JAN86, nowhere else.

2718. *October 3, 1985* PRTUV *Eric*

Corrected two bugs: it printed one too many lines when NCOUNT was zero and the test for UVRANGE(2) < UVRANGE(1) had an error affecting small values of UVRANGE.

Moved from 15JAN86, nowhere else.

2719. *October 8, 1985* DBCON *Bill*

Corrected numerous small bugs. DBCIN was not returning the proper error code if one of the input files was not found. This condition was trapped later, but gave mysterious error messages. FRMAT had a number of bugs which caused it to erronously declare data sets incompatible. FRMAT was also modified to allow a single, unmatched unlabeled random parameter. This seems to be necessary because data from the Pipeline(?) appears to have 8 random parameters, the last being unlabeled and throughly undocumented (*i.e.*, useless).

Moved to 15JAN86, nowhere else.

2720. *October 21, 1985* COMB *Eric*

Removed the reference to the deceased COMBCODE help file from the COMB help file.

Moved from 15JAN86, nowhere else.

2721. *October 22, 1985* Cookbook *Eric*

Put the new *COOKBOOK* into the DOCPUBL: area. It includes the .TEX files COOK0, COOK1, COOK2, COOK3, COOK4, COOK5, COOK6, COOK7, COOK8, COOK9, COOK10, COOK11, COOK12, COOK13, COOK14, COOKG (Glossary), COOKZ (Appendix Z), and COOKR (additional recipes) and the revised tex macro files COOK82.MAC and COOK82G.MAC (Glossary). Deleted all the old *COOKBOOK* files.

Moved from 15JAN86, nowhere else.

2722. *October 22, 1985* IMEAN *Eric/Neil*
Corrected handling of history file and date line in plot per Neil's corrections of August 26 in 15JAN86.
Moved from 15JAN86 this date, nowhere else.

CHANGE.DOC: 15JAN86 Version as TST

2723. *July 19, 1985* Tick labels *Eric*
Changed CTICS, TKTICS, ITICS to display the left-most digit (usually the sign for declination) whenever the next digits change (usually hours or degrees).
Moved to 15OCT85 this date.

2724. *July 19, 1985* Task communication *Eric*
The Cray has some trouble telling if a task is currently queued to run but has not yet started. Changed the algorithm for waiting on task start-up and resumption by adding a loop at the beginning to wait until the task signals that it has begun (by clearing its name from the TD file). The loop is executed no more than 100 times with a calling program specified time delay. I wrote a new subroutine TASKWT to implement the whole algorithm and revised AU2 (verb GO), QMNGR, and AIPSC to call TASKWT rather than doing the algorithm themselves.
Moved from 15OCT85 this date, to VP Cray a week previous.

2725. *July 23, 1985* UVMAP *Pat*
The variable FFRAC in routine CONGRD had been incorrectly declared as type INTEGER*2 instead of REAL*4. This was causing spectral line mode to fail completely. Continuum mode may also be suspect.
Moved to 15OCT85 this date.

2726. *July 23, 1985* TOVLB *John*
Added by Editors from CHKOUT *history:* Fixed bug in DAYYR subroutine.
Moved nowhere.

2727. *August 1, 1985* GRDAT (CRAY change) *Bill*
Removed index from BUFF1 in call to CATIO.
Moved from CRAY this date, to 15OCT85 this date.

2728. *August 1, 1985* ASCAL (CRAY change) *Bill/Kerry*
Increased size of common buffer RBUF from 2500 to 4096 R*4 words both in DCAL.INC and in setting JBUFSZ in SCLFND and VISCOR. In VISCOR, fixed equivalence of RBUF with IBUF and OBUF. In SCLMOD, changed to use RBUF instead of BUFF3. In SOLVE, changed to use all of RBUF (*i.e.*, JBUFSZ*2)
Moved from CRAY this date, to 15OCT85 this date.

2729. *August 7, 1985* COMB *Eric*
Corrected the help file description of the CLIP operation. Added a time delay after the master clear for I^2S Model 70 in YTVMC to allow the ISU program to recover.
Moved to 15OCT85 this date, nowhere else.

30. ***August 13, 1985*** **Going AIPS** ***Bill***

Updated version for 15 July 1985. Contains a new chapter on high level utility routines such as 2-D FFTs and model calculations for *uv* data. The chapter on APs has been revised to describe the new set of AP interface routines. The chapter on Z routines had a number of routines missing which now are included. The chapter on tables (which was added since the first printing) was expanded to include descriptions of the tables to be used for calibration and editing. Several of the chapters have been renumbered. The printed version will be in two volumns with the first containing the more general chapters (catalogues, I/O etc.) and the second including the more specialized chapters (TVs, APs, Tapes). Files affected in the DOCTXT: area were GOINAIPS.INC, GOINAIPS.RNO, CHAP2.RNO, CHAP3.RNO, CHAP4.RNO, CHAP5.RNO, CHAP6.RNO, CHAP7.RNO, CHAP8.RNO, CHAP9.RNO, CHAP10.RNO, CHAP11.RNO, CHAP12.RNO, CHAP13.RNO, CHAP14.RNO, and CHAP15.RNO.
Moved nowhere.

31. ***August 13, 1985*** **ISU init** ***Eric***

Added support for initializing the Image Storage Unit from a host disk file. Changed:

TVC.INC	—	Added declaration ISUNUM, the number of ISUs in the system.
TVC.INC	—	Changed to put ISUNUM in Common.
INIT	—	(IIS) Added call to YISULD, removed calls to YTVCIN and YTVMC. These are done by TVOPEN and, since most sites depend on the TV disk file and do not modify YTVCIN, the call to YTVCIN would cause incorrect TV parameters to appear!
TVCIN	—	(IIS) Changed to zero ISUNUM.
ISLOD	—	(New: IIS) Loads ISU programs to ISU units from disk.
PHFIL	—	(VAX) Changed to have 'IS' files public.
ETTVP	—	Added inquiry about number of Image Storage Units. Also corrected error in DATA statement for ONE and F.

Moved nowhere.

32. ***August 13, 1985*** **EGETNAME** ***Eric***

In working on the *COOKBOOK*, I discovered that the help files for EGETNAME and GETNAME were identical. Added stuff to the one for EGETNAME to describe the differences.
Moved to 15OCT85, nowhere else.

33. ***August 14, 1985*** **POLCO.HLP** ***Neil***

Added units of PIXSTD to HELP file.
Moved nowhere.

34. ***August 15, 1985*** **MX** ***Bill***

Modified data selection routine MXSEL to carry weights for each bandwidth synthesis channel in the *uv* work file. This allows combining data from several arrays, some of which were observed with bandwidth synthesis and some without. The data which were observed without bandwidth synthesis should be converted into a multichannel data set with all but the reference channel flagged before combining with the bandwidth synthesis data. In previous versions of MX, all frequency channels were required to be unflagged before a visibility point was used; this prevented combining data. MXSEL now calls DGINIT and DGGET (the calibration package data selection routines) to do the data selection. The UVWORK file now has a structure much closer to normal *uv* data files so the *uv* utility tasks are less likely to give strange results.
Other minor changes: the default IN2NAME is now OUTNAME and CC extension files are not created if the image is not to be CLEANed by MX. Changed MX.HLP to give new default for IN2NAME.
Moved nowhere.

35. ***August 15, 1985*** **UV Data selection routines** ***Bill***

Changed the linkage to the calibration package data selection routines DGINIT and DGGET to pass data thru the call sequence rather than through the commons in DSEL.INC and CSEL.INC. This allows simplified use of these routines. Also changed UVGET and DATGET to reflect the new call sequences to DGINIT and DGGET.
Moved nowhere.

2736. *August 15, 1985* BATER *Eric*

Added by Editors from CHKOUT *history:* Fixed the SUBMIT verb to use the new task communication routines.
Moved to 15OCT85, nowhere else.

2737. *August 16, 1985* COPY *Pat*

The changes to catalogue files had broken the COPY program. It now supports the new CB file structure.
Moved to 15OCT85 and VLA this date.

2738. *August 16, 1985* PRTACC *Eric*

Changed to make more of the counters INTEGER*4 to handle large accounting files and to call QMNGR an "AIPS" program.
Moved to 15OCT85, nowhere else.

2739. *August 19, 1985* VM *Tim*

Changed to accept floating format images in any slot, but will output in same format as dirty image. Changed help file to reflect the new generality.
Moved to VLA.

2740. *August 20, 1985* ISU init *Eric*

Changed and added support for initializing the Image Storage Unit from a host disk file. Changed:

YINIT — (IIS) Changed call to YISLOD.
YISLOD — (IIS) Changed call to allow ISU to disk transfers and to use the TV parameter file records 2 and beyond for the ISU control program.
ZPHFIL — (VAX) Dropped 'IS' files.
SETTVP — Added code to initialize the ISU control program parts of the TV parameter file.
FILINI — Changed to zero record 2 of the TV parameter file.
FILAIP — Changed to zero record 2 of the TV parameter file and to make that file bigger if there are ISUs.
FILAI2 — Changed to zero record 2 of the TV parameter file and to make that file bigger.

Moved nowhere.

2741. *August 20, 1985* General help files *Eric*

Updated and corrected the general help files: ANALYSIS, APTASKS, CATINFO, GENERAL, INDEX, MAPETC, PL2D, POPSYM, TAPU, TVGEN, UVPR, and VLBI.
Moved to 15OCT85, nowhere else.

2742. *August 21, 1985* VM *Bill*

Cleaned up several problem areas which were causing problems on the Cray. The I/O buffers are now declared independently rather than a single equivalenced array; this allows vectorization in most routines and removes the problems of equivalencing multi-dimensional real and integer arrays. A compiler directive INCLUDE was added in subroutine CONV to allow vectorizing complex arithmetic and the loop in STEP was broken into two to allow partial vectorization. The indexing of variables in several routines was changed to make it easier for vectorizing compilers to vectorize. The size of the buffers is now correctly computed; the old version assumed 2 integers per real. The output image was changed to floating-point format. The BLOCK DATA routine was replaced. Also changed the include files DVMN, CVMN, EVMN, VVMN and IVMN.
Moved to Cray this date, nowhere else.

2743. *August 23, 1985* UVFIT *Bill*

The default antenna gain was the antenna number; this leads to exceedingly poor behavior and bad answers if it ever did converge. Defaults are now 1.0.
Moved to 15OCT85 this date, nowhere else.

2744. *August 23, 1985* POLCO *Neil*

The number of rows and number of columns were back to front. Program would therefore fail on non-square images.
Moved to 15OCT85 this date.

2745. *August 26, 1985* VBPLT *Bill*

Numerous small fixes. Now correctly handles size of uniform spheres (in the old version nothing appeared resolved). Also will now plot models for REAL and IMAGinary parts. Logic in REEDIN to detect the model type was inverted so all components were considered point components.
Moved to 15OCT85 this date.

2746. *August 26, 1985* IMEAN *Neil*

The variable CNO1 (catalogue slot number) was incorrectly passed to the subroutine HIPLOT as CNO1 so that the history file could not be found. In the subroutine HLAB, the variables DATE and TIME were incorrectly ENCODEd as ADATE and ATIME so that the histogram plot creation date and time were not recorded on the plot.
Moved nowhere.

2747. *August 28, 1985* ISU bugs *Eric*

I finally had a chance to test the ISU code and, of course, had to correct bugs in YISLOD and SETTVP.
Moved nowhere.

2748. *August 29, 1985* XPORT *Bob Duquet*

Added by Editors from CHKOUT *history:* New task to write a file on the local disk system containing a header and coded image values suitable for transmission via networks and recapture in another *AIPS* system via the task MPORT. Also files XPORT.HLP, CXPT.INC, DXPT.INC, and EXPT.INC.
Moved nowhere.

2749. *September 4, 1985* TV master clear *Eric*

Changed YTVMC (I^2S Model 70 version) to do time delay only if there is an ISU unit.
Moved nowhere.

2750. *September 4, 1985* MCUBE *Eric*

Fixed up MCUBE to handle the building of n-dimensional images from either n- or $(n-1)$- dimensional images where n can be as small as 1. Changed WRPLAN call sequence to have the dimension be the desired output axis rather than the highest input axis. Changed WRPLAN and WRBLNK to handle writing individual rows. Changed the help file, deleting INTYPE and adding DOALIGN. MCUBE will also create a SEQ.NUM. axis if the two images have identical headers and can create a "cube" from one input image, extending the highest numbered real (> 1 point) axis. Changed WINDOW to complain only about axes with more than one point. Changed COMOF3 to accept axes where the header says there is less than 1 point on the axis. Also changed DMCU.INC and CMCU.INC.
Moved nowhere.

2751. *September 4, 1985* DOALIGN *Eric*

Corrected DOALIGN computations to use double precision throughout in the tasks BLANK, BLSUM, COMB, CORMS, GREYS, and PCNTR.
Moved to 15OCT85, nowhere else.

2752. *September 5, 1985* Slices *Eric*

The removal of INTYPE from the inputs to SLICE had a ripple effect. Corrected TKSLIN and SL2PL to pick up the correct corners and to use ZFIO rather than ZFI3.
Moved to 15OCT85, nowhere else.

2753. *September 13, 1985* SMOTH, MOMNT *Eric*

Added history file operations and cleaned up typing a little. Changed FILOPN to set all of the "in/out" parameters — the sequence number and disk were not being set! Declared variables in SMOTH and MOMNT and removed INTYPE from the Fortran and help files.
Moved nowhere.

2754. *September 13, 1985* Misc bugs *Fujitsu/Eric*

In installing *AIPS* on a Fujitsu, several non-standard Fortran constructs were discovered and reported. Fujitsu provided a detailed, 63-page report with the "wish that having this report *AIPS* would grow up with much portability." The problems reported were all violations of *AIPS* standards and included integer constants in call sequences, lower case in executable code (lower case is acceptable only in character string constants and format elements), inline comments beginning with ! in any column, jumping into a DO loop, changing the DO loop limits and increment within the DO loop, PARAMETER statements without enclosing parentheses, use of BYTE data type, more than 19 continuation lines, and variable, common, or program names of more than 6 characters. Many of these problems have been corrected by Kerry's work on UNIX and Cray ports. The problems not previously corrected were (mostly) corrected now:

HICOPY — Variable n1 changed to N1.

APCLN — DO loop upper limit changed inside loop in DECIDE.

MX — DO loop upper limit changed inside loop in MDECID.

IMFIT — Bad branch address in IMFERR for error handling: GO TO 90 changed to GO TO 900.

TOVLB — Lazy coding lead to a branch into a DO loop (followed by a branch back out). Added 2 lines of code to avoid this illegal practice. Corrected error — routine DMAP which computes apparent positions had a typo which could cause the returned declination to be -2π. Changed DAPCEC to DAPDEC. Corrected another error — routine GSTO was computing the Greenwich sidereal time at midnight because the input parameters were incorrectly typed (changed NHUT to NUTHR, NMUT to NUTMN, NSUT to NUTSC). Did not attempt to bring the code to our standards for declarations. If the original programmer had even even attempted to do this, these bugs and others (presumably) should have been discovered.

TVSLD — Added comments in the beginning - BYTE variables are very nonstandard, but Fujitsu's suggestion of replacing them with LOGICAL*1's is probably even worse. Shortened NOFRAME to NOFRAM. Declared 36 variables.

TVSLV — Changed SCHRIJF to SCHRIF.

VBCIT — Removed inline comment, changed MSGWRT calls. Declared variables (there were 74 diagnostics). Variable name ORBITERS shortened to ORBTRS.

VBPLT — Changed apparently crazy branch to end of a DO loop into something more reasonable. The task should never have taken this branch, however.

AVTP — Common name INPARMS shortened to INPRMS.

VBFIT — Variable name APARM52 shortened to APRM52. Declared variables (first try had 162 diagnostics). Corrected bug: it was picking up the number of components in the old way (*i.e.*, 1 value, now 0) rather than using the 16 being passed by the user in adverbs.

VSCAL — Removed unused, excessively long variable BINDNAP. Declared variables (first try had 226 diagnostics). Corrected incorrect handling of user-input NCOMP.

DTTIME — Changed COMMENT to COMENT and fixed message level to 5.

BCAL1 — Shortened FILEOUT to FILOUT, fixed bug in which XDISIN appeared in the common statement (in the *important* routine) as XDISINC. Declared 14 variables.

EFU2.INC — Deleted as obsolete (had a missing comma).

Moved correction (not declarations) to 15OCT85 on 16-Sep, nowhere else.

2755. *September 16, 1985* UVGRID *Eric*

Changed message level of data mis-sorted message from 1 to 6 in order to have it recorded in the message file.
Moved to 15OCT85, nowhere else.

2756. *September 17, 1985* DBCON.HLP *Bill*

Clarified explanation of the DOARRAY adverb.
Moved nowhere.

2757. *September 17, 1985* XPORT *Bob Duquet/Kerry*

Added by Editors from CHKOUT *history:* New version of Fortran and help files.
Moved nowhere.

2758. *September 17, 1985* Directory Structure *Gary*

Many changes, mostly in Z routines and DCL procedures, to switch to a new directory structure as a first step in going to a search path concept for device-specific subroutines and to shared images. While I was at it, the version-specific *AIPS* data files were given a new naming convention. The volume number was replaced by an *AIPS* data-format version letter (15JAN86 is A). This should provide numerous advantages in automatically insuring that a given release of *AIPS* is operating with compatible data. Also data with different formats can coexist in the same data directory. Z routines changed:

ZDIR	ZTXMAT	ZACTV8	ZDCHIN	ZMYVER	ZPHFIL
ZTOPEN	ZWHOMI	ZDOPRT	ZQMSIO	ZPARS	ZACTV9
ZSETUP					

DCL procedures, many written by Pat Moore, completely replace the old stuff like ASSIGNL and ACOMLNK.

AIPS	AIPSDBG	AIPSPROG	AIPSUSER	ASSNBAT	ASSNDEV
ASSNDISK	ASSNPROG	BOOTUP	BUILDSHR	COMLNK	COMPILE
COMRPL	COMTST	CREADIR	CREATAB	CREATOLB	DIRTY
LINKDBG	LINKNOD	NOWARN	SETVER	USEPRGLOG	USEUSELOG

Moved nowhere.

2759. *September 18, 1985* RDUSER *Gary*

No longer puts ENTER USER NUMBER in the message file under user 1.
Moved nowhere.

2760. *September 18, 1985* MOMNT, XMOM *Eric*

Changed MOMNT and the help file to provide a default set of output moments (0,1, and 2) and to describe all the defaults. Made clearer error messages as well. Added to both help files some description of the differences betwen the two tasks.
Moved nowhere.

2761. *September 18, 1985* UPDAT *Gary*

This standalone utility will update data from 15OCT85 to 15JAN86. It has the hooks in it to be a "master data format update" routine, that will contain subroutines to do all future updates. Remote sites will be able to run this program routinely after an update by telling this routine their current version and letting it run. Because of the new naming conventions this routine can be run on the same data more than once.
Moved nowhere.

2762. *September 18, 1985* Useful subroutines *Gary*

The following routines were written for UPDAT, but will be useful for future programs of this type. These free-form input routines could be retrofitted to SETPAR, FILINI, etc.

AIPINI — Does standard *AIPS* inits necessary for standalone routine.
INQINT — Allows free form integer input from the TTY.
INQFLT — Allows free form real input from the TTY.
INQSTR — Allows string input from the TTY and unpack.

Moved nowhere.

2763. *September 18, 1985* ZTOPEN *Gary*

This routine was passing a CHARACTER*8 variable to ZDIR which expected a CHARACTER*9. This caused ZDIR to build a file name with the null character embeded. This did not seem to hurt anything, but I fixed it anyway.
Moved nowhere.

2764. *September 18, 1985* ZDCHIN *Gary*

Error logs from aborts now go in the version-specific directory AIPS_VERSION:[ERRORS]. This should help us keep track of what aborts occured in what version better.
Moved nowhere.

2765. *September 19, 1985* TABFLG *Bill*

Added opcode to mark entry as flagged; REASON in call list is now a packed character string.
Moved nowhere.

2766. *September 19, 1985* COMTAL Y *Eric*

A set of routines to support a Comtal 1/20 TV display device were submitted by Andy Lubenow quite some time ago. I finally got around to checking them over and putting them into the system. They use generic routines:

YCHRW	YCINIT	YCNECT	YCOVER	YCREAD	YCUCOR
YCURSE	YCWRIT	YFIND	YISLOD	YLNCLR	YLOCAT
YLOWON	YSLECT	YTCOMP			

They use stubbed routines:

YALUCT	YCONST	YFDBCK	YGGRAM	YGRAFE	YGYHDR
YIFM	YISDRM	YISDSC	YSIJMP	YISMPM	YMAGIC
YMKCUR	YMKHDR	YMNMAX	YRHIST	YSHIFT	

They use Comtal 1/20 versions of the standard routines, most of which I modified a bit:

- YCRCTL — Changed ZTTYBUF to ZTTBUF.
- YGRAPH — Corrected error: it was turning on the graphics plane and then turning it right back off. Added a GO TO 999.
- YIMGIO — Renamed YLINETV to YLINTV, YCOMSET to YCMSET.
- YINIT — Restored calls to MOVIST and YSPLIT, dropped YTVMC section, changed ICINIT to YCINIT.
- YLUT — Changed to activate the channel via YCHACT because the Comtal will hang if it is not on when an LUT is written. Simplified the extraction of the requested channel using YLOWON.
- YOFM — No significant changes.
- YSCROL — Note: this version cannot scroll graphics.
- YSPLIT — Changed to activate the lowest channel requested in quadrant 1 on WRIT. On READ, it simply returns TVLIMG since I didn't know how to read such info from the Comtal.
- YSTCUR — Is a 2nd-level routine with a different call sequence than used in the I^2S version. Corrected error in error message encoding.
- YTVCIN — Revised to give 0 for ISUNUM.
- YTVCLS — Calls ZV20CL.
- YTVMC — Calls ZV20MC.
- YTVOPN — Calls ZV200P, initializes one common variable.
- YZERO — Probable error corrected: a blank line appeared in the spot where a call to YCMND to clear a gray plane should have been.
- YZOOMC — No significant changes.

Andy's package included special routines:

- BYTE2I — Converts BYTE variable to INTEGER*2.
- I2BYTE — Converts INTEGER*2 variable to BYTE.
- DV20.INC — Declares some standard variables.
- VV20.INC — DATAs some of these variables.
- YCMND — Sends command string to Comtal via ZV20XF.
- YCHACT — Added by Eric after talking to Andy: activates a gray or graphics channel (using code removed from YCMSET).
- YCMSET — Sets Comtal for I/O via ZBDRIVER, displays requested image plane, activates pseudocolor when requested. It is called by YIMGIO only: was called YCOMSET. Changed it to call YCHACT on first line or if channel number has changed.
- YLINTV — Moves the data line to/from the TV. (Andy called this YLINETV.)
- ZTTBUF — Was called ZTTYBUF, simulates trackball reading "button" from the keyboard.
- ZV20CL — Also closes ZBLUN in common V20.
- ZV20MC — Null routine.
- ZV200P — Uses blank common for IZLUN (nothing else does visibly).
- ZV20XF — Added forgotten(?) call to MSGWRT.

Dropped Andy's BYTSWAP replacing it with ZBYTFL. All of Andy's routines were altered in their typing and some variables needed declaring. Due to the apparently necessary use of octal constants, BYTE variables, etc., these routines are likely to work only on VAXes. The Z routines are for VAXes.

Moved to 15OCT85, nowhere else.

2767. *September 19, 1985* TV blinking *Eric*

While working on the Comtal routines, I checked all the code which uses split screen since that function is not available in the Comtal Y routines. I found that the blink function was not prepared to deal with such a case. Changed AU6A, TVBLNK and the help files for TVBLINK and TVMBLINK to handle the absence of split screens and to modify the meaning of button C in both verbs and button B in TVMBLINK. Now, both images will be enhanced simultaneously on button C (in blink mode) for TVBLINK and TVMBLINK. Button B in TVMBLINK selects autoblinking.

Moved to 15OCT85, nowhere else.

2768. *September 20, 1985* ZACTV8 *Gary*

Fixed bug introduced in directory changeover. When version was set to TSTPSAP, ZACTV8 would not look in the regular LOAD directory to start up a non AP task.

Moved nowhere.

2769. *September 20, 1985* LIBR.DAT *Gary*

Added COMTAL libraries and directories.

Moved nowhere.

2770. *September 23, 1985* PLROW *Eric*

Corrected error: it failed to check for blanks when figuring out the vertical scaling. This led to an excess amount of white space between the top row and the top border line.

Moved nowhere.

2771. *September 23, 1985* POPSDAT.HLP *Bill*

TIMERANG was incorrectly dimensioned 9 rather than 8.

Moved nowhere.

2772. *September 23, 1985* AIPS.COM *Gary*

Put in cleaner way of starting up NEW AIPS. Changed terminal that uses the message terminal from TXA5 to TTA5.

Moved nowhere.

2773. *September 23, 1985* ZRM2RL, ZDM2DL *Lloyd Higgs/Gary*

These Macro routines were using registers without saving them.

Moved nowhere.

2774. *September 23, 1985* More bugs *Eric*

Corrected:

- ISCALE — to load 0 for blanked pixels in LG and NG transfers.
- YFIND — (YGEN:) to branch out correctly when it finds more than 1 image.
- TVFIND — to return no error when YFIND finds more than 1 image and the user correctly selects one.
- NINER — to select the correct filter array — it was off by one for the preset linear filters.
- COMLAB — to reduce the length of the name string at the top by one.
- QMSPL — to prevent the left hand label from being lost and to drop unused YTVCIN call and move the program from YPGM to APLPGM.

Moved to 15OCT85, nowhere else.

2775. *September 24, 1985* FILLR *Bill*

A pointer was not set in FLRDAT causing the RA and Dec to be trashed for a single source data set.

Moved nowhere.

2776. *September 24, 1985* AIPS.COM *Gary*

Changed so that it no longer defaults to anything (was defaulting to the current AIPS_VERSION). One must specifically enter AIPS OLD, AIPS NEW or AIPS TST. Users were getting into the wrong area by mistake.

Moved nowhere.

2777. *September 24, 1985* FLGINI *Bill*

Fixed misspelling of table title.
Moved nowhere.

2778. *September 25, 1985* UVFLG *Bill*

Modified to write flagging selection criteria to a flag (FM) table for multi-source, raw data sets. Added flagging by IF number and baseline flagging is more flexible. Also changed/added: UVFLG.HLP, DFLG.INC, CFLG.INC. Removed KEYIN *et al.* from file.
Moved nowhere.

2779. *September 25, 1985* KEYIN *Bill*

Cleaned up, *AIPS*ized version of the CalTech KEYIN parsing routine. This version will read pre-opened text file in the RUN area. KEYIN is a general parsing routine which is useful whenever users need to specify information by means other than AIPS adverbs. Uses the following routines:

CITEXP — to evaluate expressions.
CITCPR — to compare character strings with wildcard option.
CITC2I — to decode integer from character string.
CITC2R — to decode real values with embedded : (= divide by 60).
CITC2D — to decode real values from a character string.
CITSKP — to find next non-blank character in a string.

Moved nowhere.

2780. *September 25, 1985* Utility routines *Bill*

Added a number of generally useful utility routines:

GETNAN — to find the number of antennas in each subarray in a data set.
FLGSTK — to convert user-specified polarization flagging info into a set of correlator/IF flags.
AN1ORS — to determine the baselines specified by the AIPS adverbs ANTENNAS and BASELINE.
FLAGUP — to manage flagging (FM) table given user criteria.
SOURNU — to get a list of source numbers from SU table.
MULSDB — to determine if a dataset is single- or multi-source.

Moved nowhere.

2781. *September 25, 1985* SUBARRAY *Bill*

Renamed SUBARR to SUBARRAY, changed POPSDAT.HLP, added SUBARRAY.HLP.
Moved nowhere.

2782. *September 25, 1985* CCMOD *Imke de Pater/Bill*

The program thought its name was CTMOD and looked for CT files rather than CC files.
Moved nowhere (should be moved to 15OCT85 but I don't know how).

2783. *September 25, 1985* RECAT *Gary*

This standalone utility rebuilds catalog directory files from a users catalog header files. I fixed some bugs and added free format input. Also fixed minor bugs in UPDAT and AIPINI.
Moved nowhere.

2784. *October 3, 1985* POLISH *Eric*

Added to POLISH some tests and a message to advise users that a special pseudoverb has caused AIPS to ignore other commands on the input line. Relinked AIPS.
Moved nowhere.

2785. *October 3, 1985* PRTUV *Eric*

Corrected two bugs: it printed one too many lines when NCOUNT was zero and the test for UVRANGE(2) < UVRANGE(1) had an error affecting small values of UVRANGE.
Moved to 15OCT85, nowhere else.

2786. *October 3, 1985* OTBSRT *Eric/Kerry*

Corrected variable name FIND to IND on the file close call.
Moved to 15OCT85, nowhere else.

2787. *October 4, 1985* XPORT *Bob Duquet/Eric*

Added by Editors from CHKOUT *history:* New adverbs created for XPORT. Changed POPSDAT.HLP and added SAMPTYPE.HLP and CODETYPE.HLP.
Moved nowhere.

2788. *October 8, 1985* DBCON *Bill*

Corrected numerous small bugs. DBCIN was not returning the proper error code if one of the input files was not found. This condition was trapped later, but gave mysterious error messages. FRMAT had a number of bugs which caused it to erronously declare data sets incompatable. FRMAT was also modified to allow a single, unmatched unlabeled random parameter. This seems to be necessary because data from the Pipeline(?) appears to have 8 random parameters, the last being unlabeled and throughly undocumented (*i.e.*, useless).
Moved to 15OCT85, nowhere else.

2789. *October 11, 1985* MX *Bill*

Changed MXMAP to rerun MXRHIS more readily. This is for when MX is restarting a CLEAN and an accurate value of the maximum residual is not known in advance to compute the residual histogram. This should eliminate the occasional problem of 0 residuals being loaded into the AP on a restart.
Moved nowhere.

2790. *October 11, 1985* AU9 *Gary*

Changed MAXFIT verb so that if fit fails, an error message is printed but the AIPS error routines are not called. This allows fit failures in *POPS* procedures without the procedure aborting.
Moved nowhere.

2791. *October 15, 1985* FITS readers, writer *Gary*

I updated FITTP, IMLOD, and UVLOD to read and write the general table format plus handle the *AIPS* conventions for encoding hexbits, logical values, and small integers. I also fixed some bugs and made some requested changes. UVLOD and FITTP were using slightly different versions of some internal and external subroutines. These were fixed up to be used by both tasks. Subroutines:

ATCONV — Sets up *AIPS* table conventions for things like hexbits and small integers (new).
CHKTAB — Modified to be used by both UVLOD and IMLOD.
EXTREQ — Modified to be used by both UVLOD and IMLOD.
GETKEY — Parses input for keyword value (new).
GTPAIR — Gets a keyword and keyword value from a table file (new).
ISTAB — Tries to figure out if an extension file is a table (new).
MAKTAB — Creates a table file on disk (new).
RWTAB — Reads a line of table data from tape and write it to disk (new).
SETDEF — Modified to be used by both UVLOD and IMLOD.
SKPEXT — Modified to be used by both UVLOD and IMLOD.
TABFRM — Parses a format specifier (new).
TABHDR — Modified to be used by both UVLOD and IMLOD.

Bugs fixed:

DTHD.INC — Increased dimensions to handle large calibration tables.
VKEY.INC — Blank pixel value was not being decoded and written to tape properly because of error in this DATA statement.
FITTP — Changed to print a warning if BLC and TRC are used for writing a subset of an image.
IMLOD — OUTSEQ = -1 now works (uses the sequence number of the file on tape). NCOUNT was added to allow reading a series of files. DOTABLE was added so the user can choose not to load CC files. Gives a better error message (rather than divide by zero) when the user tries to load a *uv* data set.
UVLOD — NFILES now works properly for negative values.

Moved nowhere.

2792. *October 15, 1985* AU2, AU1A, NOADVERB.HLP *Gary*

Users continue to get confused when new adverbs are added but do not appear in their workspace because the old workspace in LASTEXIT was restored. I added an error message to GO and INPUTS to remind users of RESTORE 0 and to direct them to help file NOADVERB for a detailed explanation of the problem.
Moved nowhere.

2793. *October 16, 1985* Misc *Gary*

Added by Editors from CHKOUT *history:* Revised VAX version of ZSTOPA to remove useless test. Fixed ZPARS to have a large enough work buffer for all possible VERSION values. Fixed spelling of DOWIDTH in SLFIT.HLP.
Moved nowhere.

2794. *October 17, 1985* ZC8CL *Gary*

This routine was using CHCOPY. This was a very inefficient way to move large blocks of data around in a Z routine.
Moved nowhere.

2795. *October 17, 1985* TABLIN *Gary*

This routine was changed from using a call to ZC8CL to convert characters in place and a CHCOPY to get a line of data to using ZC8CL to do the convert and move all in one call. With the new ZC8CL this makes about a 30% change in the speed of loading large CC tables. (With the old ZC8CL it made no difference at all).
Moved nowhere.

2796. *October 18, 1985* POLCO *Neil*

Added BADDISK adverb to Fortran and help files.
Moved nowhere.

2797. *October 21, 1985* plotting, COMB *Eric*

Changed CNTR, PCNTR, and GREYS to set the default XYRATIO with the location common axis increments rather than the header ones. This allows for rotations near 90 which cause the axes to be switched for easier plotting. Also removed the reference to the deceased COMBCODE help file from the COMB help file.
Moved the COMB one to 15OCT85, nowhere else.

2798. *October 22, 1985* Cookbook *Eric*

Put the new *COOKBOOK* into the DOCPUBL: area. It includes the .TEX files COOK0, COOK1, COOK2, COOK3, COOK4, COOK5, COOK6, COOK7, COOK8, COOK9, COOK10, COOK11, COOK12, COOK13, COOK14, COOKG (Glossary), COOKZ (Appendix Z), and COOKR (additional recipes) and the revised tex macro files COOK82.MAC and COOK82G.MAC (Glossary). Deleted all the old *COOKBOOK* files.
Moved to 15OCT85, nowhere else.

2799. *October 22, 1985* IMFLT *Richard Simon*

New task to flatten an image by fitting a plane to the image.
Moved nowhere.

2800. *October 22, 1985* COPY, ZPHFIL *Eric*

Corrected COPY to handle the new VAX physical file names (version rather than disk number in the 3rd character). Corrected declarations in ZPHFIL (VAX) for missing comma.
Moved nowhere.

2801. *October 23, 1985* TOVLB *John*

Three new inputs parameters have been added to TOVLB. YINC is the record time interval to use in the CIT Merge output file. DOHIST allows the option of not copying the *AIPS* history records into the CIT output file. ANTENNAS specifies the stations whose data will be passed. The TOVLB code has been tidied up.
Moved nowhere.

AIPS Order Form

1. Name and address of Contact Person: _____

   ☐ Address label on back is correct _____

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   (*N.B.*: If you have received a plastic mailing container from us, we insist that you use it for a reorder.)

2. ☐ new order ☐ reorder

   Version of *AIPS* currently running: _____

3. *AIPS* version desired: . . . . . ☐ 15-Oct-1985
   (Shipped ≈ 1 week after release date) ☐ 15-Jan-1986

4. Tape type desired:
   (VMS only) . . . . . ☐ VAX/VMS BACKUP
   VAX load modules desired: ☐ Yes ☐ No
   (requires 2nd 1600 bpi tape)
   (UNIX only) . . . . . ☐ UNIX tar
   Version of UNIX system in use: _____
   N.B. we need to know this. *e.g.*, bsd4.*x*, Sys III, Sys V, V7, *etc.*
   (Neither UNIX nor VMS) . . . . . ☐ Simple blocked card images
   ☐ FITS compressed text format
   Version of Z routines desired: ☐ VAX/VMS ☐ ModComp ☐ UNIX

5. Tape density desired: . . . . . ☐ 800 bpi ☐ 1600 bpi ☐ 6250 bpi

6. There are gripes on (returned) tape: . . . ☐ Yes ☐ No

7. Printed documents requested: . . . . . ☐ 15OCT85 *COOKBOOK*
   ☐ 15JUL85 *GOING AIPS* Vol 1
   ☐ 15JUL85 *GOING AIPS* Vol 2
   ☐ *AIPS* Memo No. 37
   ☐ *AIPS* Memo No. 38
   ☐ *AIPS* Memo No. 39

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National Radio Astronomy Observatory
Edgemont Road
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October 15, 1985

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