

A I P S L E T T E R

Volume VII, Number 1: January 15, 1987

National Radio Astronomy Observatory

A newsletter for users of the
Astronomical Image Processing System

Edited by

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TPXset by EWG

Do you want to stay on the *AIPSELETTER* Mailing List?

The *AIPSELETTER* currently goes out to over 700 addresses, and its production and mailing costs are beginning to cause NRAO some concern in a time of very tight budgets. We have looked at some possible economies, and are reducing the print size in the Change.Doc section as one of them. We have also considered mailing Change.Doc only to those of you who actively request it. In practice, however, Change.Doc should be of interest to any *AIPS* user whenever it refers to something that the user interacts with regularly. We are also reluctant to incur the overhead of keeping a separate mailing "flag" for Change.Doc.

We are therefore asking each of you to confirm that you need to continue receiving the *AIPSELETTER* as a whole, by returning the *AIPS* Order Form to us with confirmation of your mailing address. Please consider carefully whether you need to have your own personal copy of the *AIPSELETTER* before returning the form. Are there other copies coming to your institution that could be shared? Do you read your copy, or just file it with your "junk mail"?

In any case, anyone who does not refresh his or her *AIPSELETTER* mailing address by returning an *AIPS* Order Form to us will be taken off our mailing list after the 15APR87 *AIPSELETTER*. We will reassess other options for cutting our costs when we see what impact this has on them.

15-January-1987 Statistics

From the EXPFIT program come the following statistics for the 15OCT86 and 15JAN87 releases:

	15OCT86	15JAN87
Number of directories	74	79
Number of text files	3,188	3,331
Number of text lines	512,935	559,445
Number of bytes in compressed form	16,839,059	18,336,530

From the WHOGETS.ADR file come the following statistics for the 15OCT86 and 15JAN87 releases:

Number of contact persons	147	165
Number of <i>AIPSELETTER</i> recipients	720	735

Summary of Changes: 15 October 1986 — 15 January 1987

These changes are listed in detail in the `CHANGE.DOC` files reproduced later in the *AIPSLATTER*. There are 224 total changes this quarter, many of them devoted to corrections and improvements to the new package of calibration tasks. This package appears, in β -test form, in the 15JAN87 release. We expect that it will continue to change and grow with later releases. In particular, we expect the user interface to become simpler and easier to learn. The calibration package is described in some detail, for both users and programmers, in two articles below.

Changes of Interest to Users: 15JAN87 as NEW

The main changes in 15JAN87 were to the calibration package. New tasks, `LISTR` and `SETJY`, were added and numerous other corrections and improvements made (see entry # 3664 and separate article below). Two new tasks, `IMGPL` and `PRIMG`, to draw plots on Imagen laser printers were contributed by Brian Glendenning (University of Toronto); see entries # 3764 and 3765 for details. Other "new" things include additional adverbs for `CLIP` (see # 3652) and improved accuracy and dynamic range in the `INPUTS` display (#s 3622 and 3633). Noteworthy bug fixes were made in `UVMAP` (to restore the TV display), `VBPLT` (to allow both VLA and VLB models to be computed correctly), table copying (to avoid occasional I/O errors), `SDCLN` (to allow it to finish and to handle asymmetric cases), and `HELP` (to handle page full conditions better).

Changes of Interest to Users: 15APR87 as TST

All the changes mentioned for 15JAN87 were, of course, also made in the 15APR87 version. See the separate article below for a description of the new calibration package. Other changes to *uv* programs included the addition of the `BIF` parameter to the inputs for `UVFND`, `UVDIF`, and `UVPLT` (see #s 3780 and 3783). The meaning of `NCOMP(i) < 0` was changed for `UVSUB` (# 3725).

Tape programs received a lot of attention as well this quarter. Two new tasks, `BAKTP` and `BAKLD`, are designed to write and read back a full catalog entry, including all associated files, in a local host-dependent format. The process is intended to be fast as well as complete and meets that intention at least for VMS (see #s 3729 and 3731). `FITTP` can now write blocked `EITS` tapes with blocking up to ten logical records per tape block. This is a new international standard and puts *AIPS* back into compliance. `FITTP` can now be instructed to write images and *uv* data in either 16- or 32-bit integer format. An IEEE floating format was also added, but is suppressed for the moment until some international agreement can be reached. `UVL0D` and `IML0D` were revised to handle any legal blocking factor and to read the tentative floating point format (see #s 3798, 3820, 3799, 3800).

With the 15APR87 release, `SHOW` and `TELL` have come to *AIPS*. These verbs allow the user to communicate with running tasks. `TELL` puts the parameters in a file to await acquisition by the task at its convenience; `SHOW` is the equivalent of `INPUTS` for the `TELL` parameters (see # 3691). The tasks which support this option include `MX`, `APCLN`, `SDCLN`, `VM`, `VTESS`, `UTESS`, `ASCAL`, `MCUBE`, and most plotting tasks (see #s 3692, 3707, 3714). The geometry tasks also were improved. The interpolation order is now given directly, rather than by a code, to `LGEOM`, `HGEOM`, and `PGEOM`. `BADDISK` was dropped, the computations of the headers were corrected, and `PGEOM` was changed to write as the angle axis position angle on the sky. `HGEOM` can now convert between headers in celestial, galactic, and ecliptic coordinates. See entry #s 3744-3746 and 3755 for details.

Changes of Interest to Programmers: 15JAN87 as NEW

For programmers, as for users, the main changes in 15JAN87 were in the calibration package. An article below describes the parts of this new package. To implement the package, the tables and antennas file formats were revised in the previous quarter. This revision was completed by extending it to `BCAL2`, `SUBIM`, `CLIP`, `DESCM`, and `ASCOR` (#s 3635, 3640, 3652, 3653). Tasks which handle *uv* data have become somewhat more

difficult to write since they must be prepared to handle either single- or multi-source data files. Examples of this complexity are described for DBCON (# 3702) and SPLIT (# 3649). A summary of the calibration capabilities moved into 15JAN87 is given in entry # 3664.

Tape handling was moved last quarter into the subroutine TAPIO. It was discovered that this routine would not work correctly except on 16-bit integer machines and that its blocked record handling was not completely correct. The fixes to this routine were judged too significant, however, to be made in the 15JAN87 release. FITTP, IMLOD, *et al.* should work well enough on "normal" computers.

Portability problems relating to function name conflicts, to the use of nonstandard built-in functions, and to outside math packages are illustrated with entry #s 3632, 3615, and 3617, respectively. Porting code to non-NRAO TV devices is also difficult. A correction to the TVON/TVOFF functions is described in # 3642.

Changes of Interest to Programmers: 15APR87 as TST

As mentioned above, the area of tape I/O received significant attention for the 15APR87 release. The routines ZOPEN, ZFIO, ZMIO, ZWAIT, and ZCLOSE are no longer used for tapes. A new set of Z routines have been developed to do double buffer, sequential I/O to tapes and, eventually, to disks as well. They are called ZTPOPN, ZTPMIO, ZTPWAT, and ZTPCLS and have slightly different call sequences than their direct access disk equivalents (the open has a read/write specification and the map parameter is omitted and the wait call returns the number of 8-bit bytes read/written). See entry #3796. Most tasks should use TAPIO as an interface to these routines. TAPIO was changed to handle blocking and other matters correctly, to provide a new operation (FLSH), and to specify input length parameters in 8-bit, not *AIPS* bytes (see # 3796 and #s 3798, 3799, 3801, 3802, 3803, and 3808 for comments on usage). A number of subroutines used in tape I/O had their call sequences changed. These are SKPBLK (which will now read the next tape record if needed), EXTREQ, TABHDR, MAKTAB, SKPEXT, FWRITE, and UWRITE (see #s 3797, 3801). Be aware that IEEE floating point is already used by *AIPS* in "3-D" tables extensions and will soon be used also for the main *uv* data.

The new verbs SHOW and TELL provide an opportunity for the user to send new/changed parameters to running tasks. The task coder must, however, make provision at appropriate points to pick up these parameters. The GTTELL subroutine is used to get the parameters and SDCLN (subroutine SDITEL) provides a good example of usage. See entry #s 3691 and 3692.

Lesser changes of interest include the following. The subroutine SETVIS has a new call sequence (see # 3780). A new subroutine COORDT provides the ability to switch between celestial, galactic, and ecliptic coordinates (# 3744). The Z routines used by FILLR have now become more important as the calibration package comes into use (# 3739). The VMS procs have been improved to allow the debugger to find the correct file (# 3818) and to attempt to suppress nuisance warning messages during *AIPS* compilation (# 3651). The latter turned out not to be sufficient and users should change /WARNINGS=ALL into /WARNINGS=DECLARATIONS in SYSVMS:OPTIONS.COM to get only the desired messages.

AIPS Calibration: 15JAN87 Introduction for Users

There is experimental software in the 15JAN87 release of *AIPS* which allows calibration and editing of continuum total intensity (but not polarization) *uv* data. Spectral line data sets may be processed for continuum calibration functions (with the average of a user-specified set of channels), but 15JAN87 *AIPS* cannot do bandpass corrections, Doppler corrections, etc. (Polarization and spectral line calibration are

coming . . .) The software in its present form is not intended for routine processing of *uv* data by new users. It is “ β -test” software, *i.e.*, it is being distributed mainly for evaluation and testing by experienced users who may wish to influence the development of the calibration and editing package by providing feedback at this early stage.

This package works with multi-source, raw *uv* data files with associated tables containing calibration and editing information, in a fashion similar to that used in the DEC-10 package at the VLA. Its current editing tools, like those in the VLA’s DEC-10 package, are list-oriented. We hope to develop more elegant, graphics-oriented, tools once the basic functions of the existing calibration packages are all included in *AIPS*.

There are now three ways to import a multi-source *uv* data file into *AIPS*: (1) running task **FILLR** on VLA ModComp archive tapes, (2) running task **VLBIN** on SAO/NRAO format VLBI tapes and (3) running task **UVLOD** on a FITS tape containing a multi-source *uv* data file.

The main calibration and editing routines are:

- LISTR** — Applies calibration, editing and selection criteria and lists data and calibration tables in a number of forms, including the matrix listings familiar from the VLA package. This is the main data inspection tool in this release of *AIPS*.
- UVFLG** — Adds or deletes entries to the flag (FG) table. This is the principal means of flagging data in this release of *AIPS*.
- CALIB** — Determines gain solutions (amplitude and phase or phase, delay and rate) for calibrator sources. This routine is the equivalent of the VLA DEC-10 **ANTSOL** and the *AIPS* routines **ASCAL**, **VBFIT** and **VSCAL**. Solutions determined by **CALIB** are written into a solution (SN) table which can then be smoothed and applied to a calibration (CL) table to be applied to a multi-source file. **CALIB** will also work on single source files, for self-calibration.
- SPLIT** — Applies flagging, calibration, and selection criteria to a multi-source file and writes single source, calibrated and edited files. When calibration is complete, **SPLIT** is used to convert the data to a form suitable for the imaging and deconvolution tasks. Fully flagged data are omitted. **SPLIT** can also be used with single-source files to apply calibration tables or to select portions of the data.

Other useful routines include:

- SETJY** — Enters source flux densities in the source table.
- TABED** — General, but rather clunky, table editing task.
- PRTAB** — General routine to list the contents of tables. **LISTR** is preferable for listing **CL** and **SN** tables.
- TAFGL** — Deselect/select entries in tables. This can be used to make table entries temporarily “invisible” to the applications software. Note: deselected entries do not survive being written to a FITS tape.
- TAPLT** — Plots selected data from a table. Only one plot per page at present.
- TACOP** — Copies tables.
- INDXR** — (Re)generates an index (**NX**) table.
- ANCAL** — Does amplitude calibration for VLBI data using a text file in the Cal Tech format. Similar to the older task **VBANT**.

WTMOD — Does various manipulations on the weights of data. Most useful for VLBI data where the weights of different baselines may vary by factors of thousands. Since the weights are also “calibrated” this routine may be needed to convert VLA weights to a range printable by PRTUV, etc.

USUBA — Changes the subarray number of specified data. Mostly useful for VLBI data.

The principal calibration steps use **CALIB** (and **ANCAL** for VLBI data) to create a solution (**SN**) table or tables containing the antenna gain solutions for one or more calibrator(s); several **SN** tables may be created using several runs of **CALIB**. To calibrate multi-source files, the **SN** tables must be “applied” to a calibration (**CL**) table. **SN** tables may be smoothed and interpolated in various ways as they are applied to make a new **CL** table using any of the tasks **CALIB**, **LISTR** or **SPLIT** with adverb **DOCAL=2**. When this is done, all previously unapplied **SN** tables are processed and applied to the specified calibration table. Up to 255 calibration tables may be kept and it is recommended that you make a new **CL** table each time the table is modified. The process can be restarted (*i.e.*, reset) by returning to **CL** table 1. The **SN** tables contain a keyword (**APPLIED**) which says if the table has already been applied to a **CL** table. This keyword can be examined using **LISTR** or **PRTAB** and can be modified by **TABED**. Unwanted **SN** tables created by trial runs of **CALIB** should be discarded using **EXTDEST** before applying the **SN** tables to the **CL** table.

CALIB’s generality means that it confronts the user with a very wide range of input parameters and options. New users may find this daunting at first. **CALIB**’s user interface is still under active development — in hopes of making it less terrifying for first-time users without sacrificing its wide range of functions.

Data are edited using the tasks **LISTR** and **UVFLG**. Running **LISTR** with **OPTYPE='MATX'** gives matrix listings of the data, which help to locate bad data. **LISTR** with **OPTYPE='GAIN'** lets you examine an **SN** or **CL** table, to help in spotting bad solutions. **UVFLG** is used to enter the specifications of any bad data into the flag (**FG**) table. **UVFLG** can also deselect previous entries in the **FG** table. Note that **UVFLG** allows you to enter a **REASON** for a given set of flags: deselecting by **REASON** is a useful way to recover from mistaken flagging.

CALIB may also be used to edit data, by setting a minimum signal-to-noise ratio (**SNR**) for a given antenna. The **SNR** is determined from the scatter of the phases for phase and amplitude solutions and a more obscure method for phase, rate and delay solutions. If the **SNR** for any antenna/IF/polarization falls below the minimum **SNR**, that entry is marked “undefined” in the **SN** table. The “**WEIGHTS**” given in the **SN** and **CL** tables are the **SNRs** determined for the most recent solution.

Data falling in time between two undefined solutions will be flagged by the calibration routines. Summaries of the data flagged are given by **SPLIT**. If the **SN** table is smoothed, the undefined entries are replaced by an interpolation of the nearest good entries (no matter how distant in time); to discard such data, examine the **SN** table before smoothing and use **UVFLG** to remove the offending data.

Special notes for VLA users:

Here are the equivalences between the major steps in the VLA DEC-10 continuum calibration and the steps in the new **AIPS** software.

FILLER — becomes **FILLR** in **AIPS**. **FILLR** reads a VLA ModComp tape and writes a multi-source **AIPS** data file to disk, creating several new **AIPS** extensions: the source (**SU**) table, index (**NX**) table, channel (**CH**) table and a virgin calibration (**CL**) table. The **SU** table relates ordinal source numbers to the source names, qualifiers, calcodes, flux densities, frequencies, bandwidths, pointing positions, epochs, apparent positions, **LSR** velocities and proper motion parameters of the observations. The **NX** table defines the time stamps for the “scans,” and the **CL** table defines the equivalent of the DEC-10 gain table and its time interval. The index time stamps may be reset later by running the task **INDXR**. The **AIPS** multi-source data file and all relevant extensions may be written to tape with **FITTP**, to obtain backup, or export, copies.

Note that the *AIPS* multi-source *uv* data files contain both the AC and BD "IF pairs" from the VLA, as two *AIPS* "IFs." You may therefore calibrate the AC and BD IF's together, rather than as separate databases in the style of the DEC-10 package. (The *AIPS* IF axis is frequency-like, but the IFs are allowed to have random frequency offsets. The frequency offsets from the reference frequency are given in the CH table, which can be examined using PRTAB; LISTR also lists the correct frequency for the selected IF).

SETJY — The *AIPS* task SETJY parallels the functions of the DEC-10 SETJY.

LISTER — The main functions of the DEC-10 LISTER, and more, are in the *AIPS* task LISTR.

FLAGER — Data flagging is done with your old friend(?) UVFLG.

ANTSOL — Antenna solutions are calculated in CALIB, which writes them out as solution (SN) tables. CALIB supports ANTSOL's options for whether or not to apply previous calibrations, for source selection, for *uv*-ranges, and for type of calibration (amplitude, phase, averaging type, etc.). CALIB also allows you to point to a set of CLEAN components as a model for your calibrator, instead of using a point source model. This permits a far more general treatment of the problem of resolved calibrators. You no longer have to work with limited *uv* ranges or with "fake" flux densities as you sometimes have to with ANTSOL. Multiple resolved calibrators may be handled one at a time — you make a set of separate solution tables, one for each calibrator, then interpolate them all simultaneously into a single calibration (CL) table.

ANTSOL's solution listing functions ("go list") are embodied in LISTR's options for listing SN tables.

GTBCAL — The function of interpolating solutions into gain tables (SN tables into CL tables) is currently provided in *each* of CALIB, LISTR and SPLIT. The "go list" option in GTBCAL is embodied in LISTR's options for listing CL tables. The "go reset" option of GTBCAL is equivalent to returning to the protected version 1 of the CL table. GTBCAL will become a separate, stand-alone *AIPS* task by the 15APR87 release. There is presently no convenient way to associate subsets of the source list with subsets of the calibration source list when interpolating solutions into gain tables, as is done in the DEC-10 GTBCAL. (This feature is coming, however.)

GTBCOR and POLCAL — These have no counterpart in the *AIPS* package at present. (They are coming.)

AIPS Calibration: 15JAN87 Introduction for Programmers

The calibration and editing routines and tasks are intended to deal primarily with multi-source, raw *uv* data files with source identification number being carried as a random parameter. (Where possible, these routines should also work for single source files.) These raw data files have associated tables which contain the calibration and editing information as well as other information needed to interpret the contents of the file. These tables have specific routines to manipulate them in addition to the generic tables routines; generally there is a pair of routines, one to open/create/initialize I/O and the other to do I/O to the table.

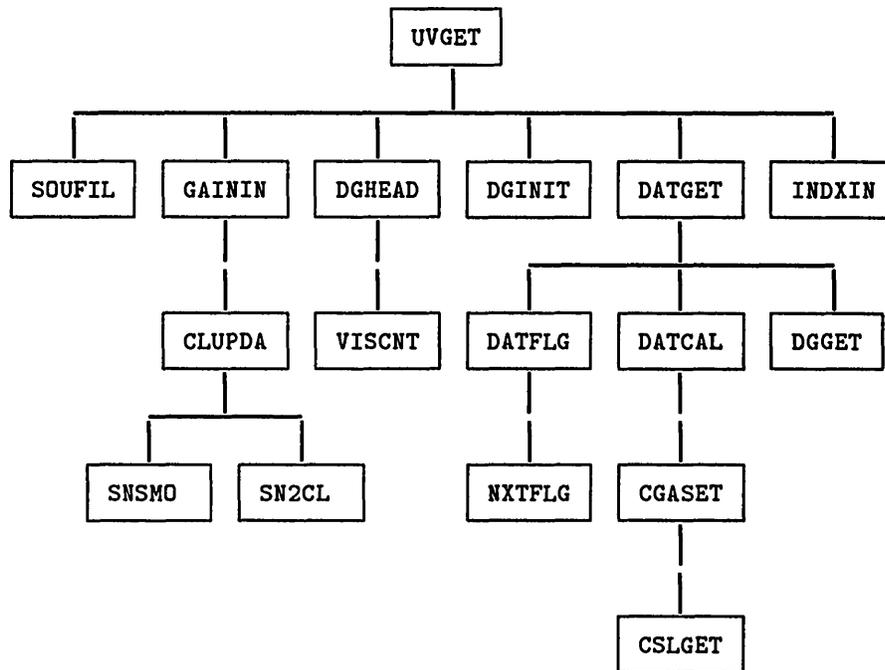
These tables are described and the names of the specific access routines are given in the following:

- AN table — This table defines the array geometry, the observing date and frequency and some time invariant properties of each array element. ANTINI, TABAN, (also GETNAN is useful).
- CH table — This table gives the frequency offset of each IF from the reference frequency. This allows IFs to have arbitrary frequency offsets. CHNDAT (also CHNCOP is useful).
- CL table — This table contains the calibration information necessary to calibrate the contents of the *uv* data file. Multi-source files only. CALINI and TABCAL.

- FG table** — This table contains descriptions of data to be rejected from further consideration. Multi-source files only. **FLGINI** and **TABFLG**.
- NX table** — The index table contains an index of the *uv* data file. Multi-source files only. **NXDINI** and **TABNDX**.
- SN table** — This table contains the solutions obtained from a calibration routine. The contents of these tables are applied to the **CL** table for multi-source files and to the data for single source files. **SNINI** and **TABSN**.
- SU table** — The source table contains the information peculiar to a given source such as the name and position. **SOVINI** and **TABSOU**, (also **SOURNU** and **FNDSOU** are useful).

The principal means of access to the multi-source files is intended to be through the routine **UVGET**. Older tasks can still process these data files, but they know nothing about the source id numbers. **UVGET** will optionally apply **FG** and **CL** tables to the data and does any necessary processing on the **SN** tables and optionally applies them to the specified **CL** table. **UVGET** also selects data using source lists, timerange, etc. and can change the Stokes type of the data (e.g., **RR**, **LL** to **IPOL**). **UVGET** uses the index table, if available, so access to small amounts of data in even large files is rapid. The routine **CALCOP** can be used in conjunction with **UVGET** to create and fill an entire file with data processed by **UVGET**.

UVGET and the routines it calls keep a good deal of information, tables and buffer space in commons defined by the includes **DSEL.INC** and **CSEL.INC**. Most of the control information is passed to **UVGET** through this common. Task **SPLIT** provides a good example of usage. **UVGET** uses a number of routines to do the specific operations, with the relationship between the routines being illustrated below.



where:

- SOUFIL** — This routine converts the list of sources to source numbers which are filled into a common.
- GAININ** — Initializes the gain (**CL** or **SN**) table to be applied to the data; calls **CLUPDA** to apply **SN** tables to the **CL** table if necessary.
- DGINIT** — Sets up to translate data (e.g., **RR**, **LL** to **IPOL**) if necessary.

INDXIN — Initializes the index table I/O and finds the first relevant index record.
DGHEAD — Fills the catalogue header record to correspond to the output data.
DATGET — Reads data, applies flagging and calibration and translates polarization.
CLUPDA — Smooths SN tables and applies them to the CL table.
VISCNT — Estimates the number of visibility records requested from the index table.
DATFLG — Flags data.
DATCAL — Calibrates data.
DGGET — Translates polarization.
SNSMO — Smooths the SN tables.
SN2CL — Applies SN tables to CL table.
NXTFLG — Manages the internal arrays containing the currently active flagging criteria.
CGASET — Interpolates gain table entries to current time.
CSLGET — Finds gain table entries on both sides of the current time and reads the values into a common array.

News Notes

The NRAO has purchased a Convex C-1 for use at the VLA site. The new machine has 64 Mbytes of memory, ten disk drives (4 Gbytes), two medium performance tape drives (1600/6250 bpi at 45 ips), and a laser printer. Financial and management constraints have resulted in the new machine not having any high performance tape drives, nor an Ethernet interface to the rest of the world. The new Convex, called **CHOLLA**, has been running *AIPS* since mid-December.

Phil Diamond, formerly of MPI in Bonn, has joined the *AIPS* Group in Charlottesville, effective 13 January. Initially, Phil will work with Bill Cotton on the calibration software effort in *AIPS*.

Leroy Napier has also been transferred, part time, to the *AIPS* Group. He will also work with the VLBI correlator operations in Charlottesville. Initially, Leroy will concentrate on various support functions for the VMS implementation of *AIPS* and will help resolve certain transportability difficulties.

AIPS Publications

There are no new *AIPS* Memos this quarter. The *COOKBOOK* has been reprinted to correspond to the 15OCT86 release of *AIPS*. The changes between this version and the previous one (15OCT85 release of *AIPS*) have all been published in the *AIPSETTTER* in a form suitable for inserting in your *COOKBOOK*. You may order the new *COOKBOOK* either en masse or a chapter at a time. Please order only what you need. This and all future reprints of the *COOKBOOK* will be on three-hole punched paper for insertion in ring binders. Specially printed ring binders are available from NRAO. However, they are not free — send \$5 (US) with your order for each binder which you require. Make checks payable to the National Radio Astronomy Observatory in US currency. Please note: the printed text for the *COOKBOOK* remains free of any charge; fees are charged only to cover the expense of printing and mailing the optional, specially-printed ring binders. *GOING AIPS* is undergoing revision and there are no copies of the 15JUL85 edition left.

AIPS Users' Group Column

The *AIPS* Site Survey is being repeated, and those of you who are registered *AIPS* "Contact People" for your sites should have received the questionnaire by the time that you read this column. Please complete and return your survey forms. In all, survey forms for 197 computers were mailed to 163 contact persons.

The 15APR87 *AIPSETTTER* should begin reporting results from the updated user site database. We have explicitly asked the sites for permission to include data from their new survey responses in other *AIPS* publications, so that we can distribute the 1987 edition of the *AIPS* Site Directory to anyone who asks for it.

Electronic Mail Addresses for AIPS-Mail

In mid-December NRAO's ARPA/Internet connection became operational, with the name "nrao.arpa", as a part of the astronomy/astrophysics networking pilot project mentioned below. AIPS-related mail may now be sent to "aipsmail@nrao.arpa". E-Mail service on NASA's SPAN network has not yet begun, but is still expected "soon".

Mail Bag

Bob Sault (University of Illinois, Department of Astronomy) writes on 9 January:

"... 15OCT86 *AIPS* has been installed on the SUN file server and appears to be functioning correctly (though it has not been extensively checked). The SUN software uses the 68881 math coprocessor for floating point arithmetic, and consequently runs at a good speed. The *AIPS* tape, Tektronix and line printer interfaces appear to work correctly. Hardcopy plots can be produced by the task LSPL, derived from TKPL, which plots on the laser printer. It is limited, however, to a single page plot, and grey-scale cannot be handled. Unfortunately there is no TV display ... The SUN *AIPS* appears much zippier to the user than the μ VAX. This is largely because the way *AIPS* handles the user log file is better suited to UNIX than VMS. Also, spawning a task is quicker in UNIX than VMS. Some rough timing comparisons for the SUN and μ VAX follow. The comparisons of elapsed times should be taken with some caution, as the μ VAX was being used by others at the time, whereas the SUN was otherwise unused.

		SUN		μ VAX	
		elapsed	CPU	elapsed	CPU
IMEAN	512x512 image	34.0	33.4	43.0	22.5
UVMAP	512 sq., 50K vis.	745.0	714.6	971.0	767.6
UVLOD	50K vis.	147.0	99.5	229.0	129.9
FITTP	512 sq. image	32.0	29.5	38.0	29.2
	50K vis.	111.0	103.0	126.0	120.1
IMLOD	512 sq. image	35.0	21.4	35.0	21.1

Though no really heavy number crunching comparisons have been done, it would appear probable that the SUN is slightly faster than the μ VAX."

[*Editor's comments:* Note that the ratios of FP-speed to integer-speed on the Sun-3/180 file server and the μ VAX II are not necessarily the same, and therefore the relative speeds of various tasks will depend on the mix of FP and integer instructions occurring in the tasks. Bob tells us that the laser printer is an Apple Laserwriter, which utilizes the "Adobe Postscript" plot-file format. His task LSPL pipes Tektronix 4012 plot output from the TKPL algorithm into a filter (provided by SUN) which converts Tektronix commands to Postscript commands. This is the first operational Postscript implementation for *AIPS* which has been reported to Charlottesville; unfortunately, it depends on a proprietary software interface. Laser printers which

support Postscript are now being offered by a variety of vendors, and therefore a general, portable Postscript solution for *AIPS* is needed. Presumably this task would be called PSPL and would have functionality comparable to task QMSPL. The *AIPS* Group offers this as a challenge problem for the *AIPS* community!]

Astronomy/Astrophysics Network: Call For Site Coordinators

The STScI (Space Telescope Science Institute, in Baltimore) is coordinating a pilot project to implement an astronomy/astrophysics network. The ARPAnet protocols (TCP/IP) are being used for the network. At the current time, some 11 institutions are represented, nearly all of which are, or very shortly will be, connected via ARPAnet. In order to implement an orderly expansion of this network, we are calling for volunteer "site coordinators" at other astronomy institutions which wish to participate. These individuals will serve as representatives for each site, will be put on an (electronic) mailing list to receive information about the status of the network, and will be expected to relay information to their colleagues. In the near future, we will be setting up a network-accessible database of astronomers, with their network addresses, etc. We would expect the site coordinators to help coordinate that effort. We are thus requesting potential site coordinators to supply the following information:

SITE COORDINATOR NAME:
FULL SITE NAME AND ADDRESS:
PHONE:
PRIMARY LOGIN NAME:
PRIMARY NETWORK MAILBOX:
ALTERNATE NETWORK MAILBOXES (if any):

We would expect the primary network mailbox to be on ARPAnet, if possible. Other mailboxes might include SPAN, BITNET, UUCP, TELENET, etc. Please send the above information to Lee Butler at the STScI; the address information below should also serve as an example of what should be submitted.

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This announcement will be appearing in STScI, NOAO, NRAO, and AAS newsletters; only one response is necessary! We are looking forward to hearing from you. If you need further information, please contact Lee Butler or Peter Shames.

[*Editors' comments:* The above notice was submitted by Ethan Schreier. NRAO is one of the institutions participating in the pilot project. The Editors encourage other astronomical organizations to cooperate with the STScI in its coordination rôle.]

CHANGE.DOC: 15JAN87 Version as NEW

- 3615.** *October 23, 1986* JIAND *Eric*
The non-ANSI standard function name is now JIAND rather than JAND. Changed QPSAP:QRECT.FOR and renamed APLUNIX:JIAND.C.
Moved to 15JAN87 this date and later 15OCT86 tapes.
- 3616.** *October 23, 1986* CSLGET *Bill*
Time from the SN records was being treated as a R*4 whereas it is really a R*8.
Moved from 15APR87 this date.
- 3617.** *October 23, 1986* VSCAL *Bill*
VSCAL was using a number of LINPAC routines which had all integers declared as simple INTEGER; even though the calling routines had explicit INTEGER*2. This only works on VAXen. The solution routines GCALC1 and NCALC and the subroutines that they call were replaced with the corresponding routines from CALIB.
Moved from 15APR87 this date.
- 3618.** *November 3, 1986* SYSUNIX:NDCODE.SED, APLUNIX:ZCH2R4 *Kerry*
NDCODE.SED is used via sed in the UNIX source code preprocessor (PP) to transform ENCODE and DECODE statements into Fortran 77 internal WRITES and READs followed and preceded by subroutine calls to perform the necessary copying from/to the CHARACTER array to/from numeric arrays of hollerith data. In order to handle error branching in ENCODE statements, the statement label involved, if any, is passed in the subsequent call to ZCH2R4 along with the IOSTAT return value. ZCH2R4 copies the internal file contents to the target of the original ENCODE. If both the IOSTAT return value is non-zero the statement label passed is non-zero, an alternate RETURN is performed. The way we had been passing the statement label was not in compliance with ANSI standard, but the Convex compiler was the first to complain. Instead, the statement label in the call to ZCH2R4 should have been prefixed with an asterisk and the dummy argument as coded in ZCH2R4 should have been a simple asterisk. Not all ENCODE statements contain the optional error branching, but the code transformer must be general enough to handle either case. NDCODE.SED now passes any statement label properly and in those cases where there is no error branch, zero is passed instead. A new argument has been added to ZCH2R4 which is used to pass the statement label as before (i.e., as a simple integer) and this is used simply to indicate if the statement label passed in the ANSI standard fashion is legitimate (i.e., non-zero). Now for the best part. Convex supports ENCODE and DECODE, so this part of UNIX/ATPS never gets exercised in NRAO. The old versions of NDCODE.SED and ZCH2R4.FOR have been saved as NDCODE.SAV and ZCH2R4.SAV, respectively, in case the the ANSI standardized versions don't work. Death to ENCODE and DECODE!
Moved to 15APR87 this date. These changes were included on the 15OCT86 UNIX/ATPS installation tape.
- 3619.** *November 3, 1986* INCALN:DAPC and CAPC *Kerry*
The variable FFTSZE was inadvertently left out of these include files. It's used to indicate if the Alliant-provided FFT routine work array requires initialization.
Moved to 15APR87 this date. These changes were included on the 15OCT86 UNIX/ATPS installation tape.
- 3620.** *November 3, 1986* AIPGUNIX:ZSTRTA, ZSTRTB and ZSTOPA *Kerry*
ZSTRTA and ZSTRTB have been changed rather drastically. Both now call ZXUID which sets the effective user id to that of the ATPS login account. They now display the chosen POPS number in hex. Reserved terminals are now implemented in the case of ZSTRTA. ZSTOPA has been deleted since it was never anything more than a null program.
Moved to 15APR87 this date. These changes were included on the 15OCT86 UNIX/ATPS installation tape.
- 3621.** *November 4, 1986* POPSGN *Eric*
Corrected POPSGN, adding conversion to upper case for member name and version and a test against a zero-divide.
Moved from 15APR87 this date.
- 3622.** *November 4, 1986* HELP and INPUTS *Eric*
Corrected a branch address for quitting on page full in AU1A. Before, a quit operation on HELP VERBS and the like would generate error messages and fail to deal with the new input line. Changed INPUTS to display more decimal places where possible.
Moved from 15APR87 this date.

3623. November 5, 1986 Bugs Eric
Corrected TABINI: it was not computing the disk requirements for the miscellaneous records correctly and hence, it would lead table copy algorithms (such as in TABSRT and TABMRG) to fail. Corrected PASS2: it was not printing error messages on several of the possible errors due to a bad branch address. Corrected SDCLB and APCLB: the computation of scratch file sizes was done incorrectly.
Moved fixes from 15APR87 this date.
3624. November 6, 1986 UVGET Bill
Changed to allow processing of first scan with only one visibility. This condition occasionally occurred and UVGET refused to proceed.
Moved from 15APR87 this date.
3625. November 6, 1986 CSLGET Bill
Local variable CURTIM changed to R*8. A critical test was incorrectly failing due to truncation of the precision of the time.
Moved from 15APR87 this date.
3626. November 8, 1986 CALINI Bill
Many of the geometric observables were not being treated as arrays although they were in TABCAL. For multiple IFs, this was causing TABCAL to overwrite values. Also corrected to always read the keyword value pairs; this was only being done on READ.
Moved from 15APR87 this date.
3627. November 10, 1986 FILLR Bill
Modified to write dummy CL table (zeroes and ones). Also corrected several errors in writing the index (IX) table. Modified to be able to start reading in the middle of a series of Format 2 records and to concatenate multiple files on a single tape. Also FILLR.HLP, DFLR.INC and CFLR.INC.
Moved from 15APR87 this date.
3628. November 11, 1986 CALIB Bill
Fixed several bugs: (1) Only tried to update catalogue header in the history routine for single source files. (2) CLBPA was using a bad address for initializing the reference antenna array and clobbering the array in GASOLV which told which antennas had data. (3) In GASOLV, the assumption had been made that the time associated with an index (IX) table entry was the start time; this has been corrected to use the time as the center time. (4) Initialization of the solution and "got antenna" arrays was moved to before the polarization loop. (5) The computation of the time interval to put in the SH table for phase-amplitude solutions has been corrected.
Moved from 15APR87 this date.
3629. November 11, 1986 FILLR Bill
Corrected logic which was causing multiple copies of some CL records to be written.
Moved from 15APR87 this date.
3630. November 12, 1986 UVMAP Eric
Corrected bad reference to the grid file which prevented the uv distribution from being displayed on the TV.
Moved from 15APR87 this date, nowhere else.
3631. November 13, 1986 FITTP Bill
FITEXT was failing to write the END card of a table header if it was the last card of a block. Fixed this and added SU, CH and CL to the list of "required" tables that will always be written if present.
Moved from 15APR87 this date.
3632. November 13, 1986 VM, VTESS, UTESS Eric
Changed VM, UTESS, VTESS, DVMM.INC and DVMT.INC to rename the function routines OPEN and CLOSE since those conflict with standard C-library routines on μ -VAXes.
Moved from 15APR87 this date.
3633. November 17, 1986 INPUTS Eric
Raised the default limits on numeric parameters to $\pm 10^{16}$ from $\pm 10^{10}$ in AU1A. Also fixed AIPSC which checks GO limits.
Moved this fix from 15APR87.

- 3634. November 19, 1986** SETLOC *Eric*
Added tests to check for angle projections which are not supported. The routine proceeds, but issues a warning and uses pure linear, generic type axes. Kesteven pointed out a potential zero divide in NEWPOS in the ARC projection which I also corrected.
Moved to 15APR87 this date.
- 3635. November 20, 1986** BCAL2 *Bill*
Modified to copy all tables rather than trying to use EXTCOP to copy the AN tables (which no longer will work).
Moved from 15APR87 this date
- 3636. November 21, 1986** TV routines *Eric*
Corrected: YINIT, YDEA and YV20 versions. They were still multiplying the initial OFM by 4.
Moved from 15APR87, nowhere else.
- 3637. November 25, 1986** WSLOD *Eric*
Added by Editors from the checkout history file: J. M. van der Hulst pointed out that DWIN.INC and CWIN.INC did not match the version of WSLOD and provided corrections.
Moved to 15APR87 as well.
- 3638. November 26, 1986** CALIB *Bill*
Fixed problem with the weights in CLBPA. If multiple IFs and polarizations were processed, with antennas edited out of some, but not all, the baseline weights would get zeroed for the absent data. In the following solutions where there was valid data, no solution would be made for the affected antenna, resulting in low signal to noise ratios for the other antennas. Also fixed problem with the way frequencies were averaged in each IF in GASOLV.
Moved from 15APR87 this date.
- 3639. November 27, 1986** FILLR *Bill*
Increased the size of the record buffer to 64 kwords (I*2). This required changing a number of internal variables from I*2 to I*4 in DMC.INC, CMC.INC. Also removed the explicit assumption of 2 characters per integer in packed strings. There may be problems on machines with a non integral number of characters per integer. Also included P band in list of known bands. Improved reading of antenna tables from ModComp files. Now allows specifying the maximum number of tape files to attempt to read. Changed FILLR.HLP.
Moved from 15APR87 this date.
- 3640. December 1, 1986** SUBIM *Eric*
Dropped INTYPE from program and inputs, increased the buffer sizes to 4096 floating, dropped ability to handle integer images, and corrected the history file formats. Changed to copy any tables extensions rather than just CC files. Also corrected SUBIM.HLP.
Moved from 15APR87, nowhere else.
- 3641. December 8, 1986** SDCLN *Eric*
Corrected error in history card — the number of components compressed was incorrectly computed.
Moved fix (only) from 15APR87 this date, nowhere else.
- 3642. December 8, 1986** TV problems *Eric*
We have a problem: some TVs can turn on only one channel at a time. Then, if channel 1 is on and TVON(2) is received, channel 1 remains visible and the TV device knows only that channel 1 is on. A subsequent TVOFF(1) does nothing since, currently, the software does not remember that channel two is then supposed to come on. Therefore:
YLOWON — (YGEN) Changed to test bits 1 through NGRAY only and return the zero-relative least bit on. If there are no bits on, it returns 0; if there is some bit > NGRAY on, it returns NGRAY.
YDEA.INC — Added parameter for channel request save area.
YINIT — (YDEA) Corrected comment.
YLUT — (YDEA) Changed to test only grey channels on read.
YSPLIT — (YDEA) Changed to do correct test on YLOWON output, to save the requested channels, and to return the requested rather than actual channels. Removed 72 TAB characters!
YSPLIT — (YIVAS) Changed to save and return the requested channels rather than the actual ones.
YLUT — (YV20) Fixed test on output of YLOWON.
YSPLIT — (YV20) Changed to save and return the requested channels.
Moved to 15APR87 this date.

- 3643.** *December 8, 1986* IMGPL, PRIMG *Brian Glendenning*
Two new tasks in preliminary versions for Imagen 300 dpi laser printers. See entries under 15APR87 for details.
Code stored in APGVMS since it is probably VMS-specific.
Moved from U. of Toronto to 15APR87 and 15JAN87.
- 3644.** *December 8, 1986* PRTDR *Bill*
Fixed bad branch in CATIO error test.
Moved from 15APR87 this date.
- 3645.** *December 10, 1986* Gridding *Bill*
There was an error in the gridding routines for bandwidth synthesis which caused the first weight in a set of channels gridded at a time to be used for all the channels. This was a problem if channels other than the first were extensively edited.
QPSAP:QGRD4.FOR failed to increment the pointers in the data arrays if a visibility was flagged. This caused all the following visibilities in the same call to be ignored.
UVGRID was using the frequency of the first channel in a group being gridded together to determine the highest and lowest labeled value of *u* rather than the lowest frequency in the group. This caused a minor but erratic distortion of the effective gridding convolution function.
Affected files: QNOT:UVGRID, QPSAP:QGRD4, QPSAP:Q1GRD, QFPS:AP1GRD.VFC (and the Q120B: and Q5000: Fortran files derived from it).
Moved from 15APR87 this date.
- 3646.** *December 11, 1986* CIINDAT *Bill*
Now does something appropriate if no CH table is needed by the file, i.e., there is no IF axis. On read, nominal values are returned and, on write, nothing is done.
Moved from 15APR87 this date.
- 3647.** *December 11, 1986* GAININ *Bill*
Removed defective test to see if the IF axis was present. This test is now done in CHNDAT.
Moved from 15APR87 this date.
- 3648.** *December 11, 1986* UVGET *Bill*
Fixed not to return an invalid, nonzero return code under some circumstances if no flag table was found. Also modified to change the catalogue status to READ when done initializing.
Moved from 15APR87 this date.
- 3649.** *December 11, 1986* SPLIT *Bill*
Modified to work on single source data. Should now apply an SE table or nonsource selection criteria. Also SPLIT.HLP.
Moved from 15APR87 this date.
- 3650.** *December 11, 1986* ZPIIFIL *Eric*
Corrected format for TEK devices > 10. Such device numbers are used for "remote" TEKs, i.e., the user's terminal is the graphics device. Made this change also to the UNIX version — the logical there was called REMOTTn. The UNIX versions of ZWHOMI and AIPS.COM and, maybe, ZOPEN need to be fixed as well.
Moved from 15APR87 this date, also Goddard, STScI.
- 3651.** *December 11, 1986* VMS Fortran Options *Eric*
For some reason, our VAX is configured with NOSYNTAX as the default /STANDARDS setting while most VAXes, including those at the VLA, have default SYNTAX. Changed the AIPS definition of ZZFORTRAN in OPTIONS.COM to specify NOSYNTAX (on non-DIRTY compilations). Those of you who routinely use DIRTY in compiling are hereby requested to stop doing so.
Moved from 15APR87 this date, nowhere else.
- 3652.** *December 12, 1986* CLIP *Bill*
Modified to use ALLTAB to copy tables (this was missed somehow). Also added adverbs BIF and EIF to allow specification of the IF to CLIP. Also changed CLIP.HLP, D/CCLP.IHC
Moved from 15APR87 this date.

- 3653.** *December 15, 1986* DESCN, ASCOR *Bill*
Added ALLTAB to copy tables instead of EXTCOP to copy AN tables. These slipped through the big changeover and failed to copy any tables.
Moved from 15APR87 this date.
- 3654.** *December 16, 1986* AN10RS *Bill*
Fixed bug in determining baselines from adverb arrays passed; only the first element in ANTENNAS or BASELINE was being passed. Baselines also were not being specified in the correct orientation; i.e., the first antenna number could be larger than the second. These bugs affected the performance of UVFLG.
Moved from 15APR87 this date.
- 3655.** *December 16, 1986* VBPLT *Bill/Lars Baath*
Modified model uv computation routine to work for the VLA or VLBI if BPARAM(10) is set correctly. Added BIF to allow specification of the IF to be plotted. Replaced APARM with TIMERANGE, STOKES, ANTENNAS and BASELINE. This allows more flexibility in specifying the baselines to be plotted. Also VBPLT.HLP, D/CVBP.INC.
Moved from 15APR87 this date.
- 3656.** *December 18, 1986* Date displays *Eric*
Added more error handling to prevent bad dates from making bad output strings from DATDAT and TIMDAT.
Moved from 15APR87 this date.
- 3657.** *December 19, 1986* CALIB *Bill*
Fixed several bugs in handling multi-channel, single source data. Now CLBSEL is always called to select data for the solutions. Cleaned up time labels for solutions and added messages about the general progress of the task. Also CALIB.HLP.
Moved from 15APR87 this date.
- 3658.** *December 19, 1986* VISDFT *Bill*
Fixed bug for point model when only RR and LL data were present.
Moved from 15APR87 this date.
- 3659.** *December 19, 1986* UVINT.VFC *Bill*
This VFC routine was losing the loop count for Stokes correlators if multiple channels were processed. Also changed the derived versions Q120B:UVINT.FOR and Q5000:UVINT.FOR.
Moved from 15APR87 this date.
- 3660.** *December 22, 1986* UVDFI *Eric*
Corrected mishandling of IN2DISK which required that both files be on the same disk.
Moved to 15JAN87 this date, nowhere else.
- 3661.** *January 6, 1987* FILLR *Bill*
Corrected bugs which caused CL table entries to be made twice per integration time rather than using the user-provided interval.
Moved to 15JAN87 this date.
- 3662.** *January 6, 1987* SDCLN *Eric*
Bug corrected: in APCLN mode, the test for completion due to iterations was done differently in two different spots leading to conflicts if a CC merge had been done.
Moved fix from 15APR87, nowhere else.
- 3663.** *January 7, 1987* SDCLN *Eric*
The SDICLN routine had an addressing bug which affected CLEANs having CLEAN box XMIN not equal YMIN. This mostly worked after a fashion, but could blow up somewhere eventually.
Moved from 15APR87 this date, nowhere else.

- 3664. January 7, 1986** Calibration update **Bill**
A number of developments in calibration and editing software were copied from 15APR87; these will greatly increase the usefulness of 15JAN87 for calibration. The new tasks are:
LISTR — Applies calibration and flagging and displays data and calibration files in a number of ways. This is essential for editing data. Also **LISTR.HLP, D/CLST.INC**.
SETJY — Enters source flux densities into the source table; like **TABED**, but much simpler to use. Also **SETJY.HLP**.
FNDSOU — A new routine which gets a list of source numbers included or excluded based on the source list passed from AIPS.
The flux densities in the source table were changed to have a value for each IF; the affected routines (and files) are: **SOUINI, TABSOU, SOUFIL, SOURNU, FLAGUP, DVLB.INC, FILLR** and **ANCAL**. Other changes:
DBCON — When multi-source files are concatenated, the source tables are merged and the source numbers changed appropriately. Also, several other tables are merged and the source numbers suitably modified. Also **DBCON.HLP, D/CDBC.INC**.
GAINIH — A number of bugs handling defaulted table version numbers were fixed. **CL** table 1 is protected from modification.
CLUPDA — A number of bugs handling defaulted table version numbers were fixed. **CL** table 1 is protected from modification.
CALIB — The division by the fluxes in the source table now uses the flux from each IF.
FILLR.HLP — A number of improvements were made to the description of **FILLR**.
TABED — The default output file is now the input file.
Moved from 15APR87 this date.
- 3665. January 8, 1987** PRTMSG **Eric**
Fixed up error tests to avoid quitting inappropriately.
Moved to 15JAN87 8-Jan, nowhere else.
- 3666. January 8, 1987** VMS procs **Eric**
Corrected the installation proc **ICREOPT.COM**; it was writing two versions of **YPGNOTOPT.OPT** rather than one plus one of **YPGVNSOPT.OPT**.
Moved to 15APR87 this date, nowhere else.
- 3667. January 14, 1987** ANCAL **Bill**
Fixed problem in **ZAPEXT** which zeroed a random word in the catalogue header.
Moved from 15APR87 this date.
- 3668. January 14, 1987** CALIB.HLP **Bridle/Bill**
Added **EXPLAIN** section.
Moved from 15APR87 this date.
- 3669. January 14, 1987** INCCOS:*HLP.INC **Kerry**
These are special include files developed as part of last port to COS (15JUL85), but were not migrated back to CVAX. Of course, this went undiscovered until the current port and had to be recovered from an old backup tape.
Moved nowhere.
- 3670. January 14, 1987** APLUNIX:ZCH2R4, SYSUNIX:NDCODE.SED **Kerry**
ZCH2R4 had previously been changed to handle alternate **RETURN**s according to the ANSI standard, however, the proper preprocessing of **ENCODE** statements containing error branching was not possible. Similarly, **NDCODE.SED** (used to preprocess **ENCODE/DECODE** statements) has been restored to its previous form (actually it never got changed because **PUTBCK** could not swallow it and the manual copy never got done). The old form of **ZCH2R4** had been saved under **ZCH2R4.SAV** and has now been deleted. **ZCH2R4** now makes no attempt to process alternate **RETURN**s upon encountering an I/O error. We will simply have to wait until **ENCODE/DECODE** statements are converted to ANSI-standard internal **WRITE/READ** statements.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/ATPS installation tape).
- 3671. January 14, 1987** APLUNIX:ZQMSIO and ZTOPEN **Kerry**
In the course of preprocessing **ENCODE/DECODE** statements into internal ANSI standard **WRITE/READ** statements, a variable is declared at the beginning of each program unit for use with **IOSTAT**. **ZQMSIO** and **ZTOPEN** had the same variable already declared, which caused their compilation to fail. To avoid this, the problem variable was simply renamed.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/ATPS installation tape).

- 3672. January 14, 1987** INSUNIX:INSTEP* *Kerry*
These files represent the automated phase of the UNIX/*ATPS* installation process. They are Bourne shell scripts with names *INSTEP2*, *INSTEP3* and *INSTEP4*. The name *INSTEP1* is being reserved in hopes of making some of the prerequisite tasks more automated. *INSTEP2* performs all subroutine compilations and object library building. *INSTEP3* compiles and links the subset of programs/tasks required to install *ATPS* to the level where the DDT ("Dirty Dozen Test") can be run. This is recommended as a sanity check before proceeding with *INSTEP4* which will attempt to compile and link all possible programs/tasks in the *ATPS* system.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3673. January 14, 1987** SYSUNIX files *Kerry*
Various improvements and fixes were made to the generic UNIX system files. See the 15APR87 entry for details.
All moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3674. January 14, 1987** APLNRAO1 and APLVLAC1 Z-routines *Kerry*
Routines, formerly stored in *APLCVEX*, which were actually specific to the NRAO Convex implementations, have been moved to *APLNRAO1* (NRAO-CV Convex) and *APLVLAC1* (NRAO-VLA Convex). These include special versions of the file creation routines *ZCREA3*, *ZCREAT*, *ZQCRE3* and *ZQCREA*. Also added *ZSPACE* (routine used only by the NRAO Convex-specific "SPACE" facility) plus a version of *ZUID* containing hard-coded NRAO *ATPS* accounts user ids (this routine begs for a more elegant solution).
Moved to 15JAN87 this date (*APLNRAO1* stuff also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3675. January 14, 1987** Moved SYSCVEX Files *Kerry*
Files formerly stored in *SYSCVEX* that were actually NRAO Convex specific have been isolated into new areas called *SYSNRAO1* (C'ville Convex) and *SYSVLAC1* (VLA Convex). See the 15APR87 entry for details.
Moved from 15APR87 and Convex this date.
- 3676. January 14, 1987** APL1VAX and APL2VAX:ZDCHIN *Kerry*
Installers invariably fail to set the */DCHCOM/* variable *BYTFLP* to the proper value for VAXes, so these versions do it for them.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3677. January 14, 1987** APLCVEX:ZXMOUN and ZXTSPY *Kerry*
In the last release of their operating system, Convex fixed a problem related to tape allocation (*ZXMOUN*) and created a problem related to task monitoring (*ZXTSPY*). *ZXMOUN*, for Convex systems, now unloads tapes mounted without a write-ring. Formerly, on dismounts, we had to issue our own rewind/unload command, which then caused the deallocation mechanism to complain. *ZXMOUN* now also displays the status of the system tape drives before and after its actions. Convex changed the output format of the "ps" command, which must be parsed as the only known solution to task monitoring (i.e., *SPY*) in *AIPS*. This format change broke *SPY* on Convex systems and necessitated a Convex-specific version of *ZXTSPY* (i.e., instead of the generic Berkeley 4.2 version formerly used).
Moved to 15JAN87 this date.
- 3678. January 14, 1987** Alliant QCFFT *Kerry*
Alliant now provides a single precision version of their FX/Scientific Library full complex FFT routine *CFFT*. The single precision version (*SCFFT*) also allows you to toggle normalization. The default version of *QCFFT* now calls *SCFFT* and the conversion and/or de-normalization loops formerly required before and after the call to the *CFFT* have been removed. The double precision version of *QCFFT* has been saved as *QCFFT.DP*.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3679. January 14, 1987** SYSALLN Files *Kerry*
Minor mods to several files including *ASSNLOCAL.SH*, *INCS.SH* and *LIBR.DAT*. Also added a "read me" file for people doing Alliant ports.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).
- 3680. January 14, 1987** SYSSUN Files *Kerry*
Added "read me" file for people doing SUN ports as well as paraform SUN version of *LIBR.DAT*.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*ATPS* installation tape).

3681. January 15, 1987 VMS fixes Eric
Changed SYSVMS:AREAS.DAT to define APLNRA01, APLVLAC1, SYSBRA01, and SYSVLAC1. To fit the 15JAN87 system on only two 1600-bpi tapes, it was necessary to omit some stuff. Two empty libraries were deleted: AIPVMS and YVTV. This required fixing SYSVMS area files AIPPGMOPT.OPT, AIPGVMSOPT.OPT and AIPPGMOPTX.OPT which referred to the former. The INSVMS:TRANSPRT.COM file was of course also changed.
Moved from 15APR87 before the 1600-bpi tapes were written.

3682. January 15, 1987 WIIATSNEW Eric
Added by Editors from checkout history file: Updated the 15JAN87 information.
Moved nowhere.

CHANGE.DOC: 15APR87 Version as TST

3683. October 23, 1986 CSLGET Bill
Times from the SN records were being treated as R*4s whereas they are really R*8s.
Moved to 15JAN87 this date.

3684. October 23, 1986 VSCAL Bill
VSCAL was using a number of LINPAC routines which had all integers declared as simple INTEGER; even though the calling routines had explicit INTEGER*2. This only works on VAXen. The solution routines GCALC1 and HCALC and the subroutines that they call were replaced with the corresponding routines from CALIB.
Moved to 15JAN87 this date.

3685. October 23, 1986 JIAND Eric
The non-ANSI standard function name is now JIAND rather than JAND. Changed QPSAP:QRECT.FOR and renamed APLUNIX:JIAND.C.
Moved to 15JAN87 this date and later 15OCT86 tapes.

3686. October 30, 1986 POPSGN Eric
Corrected POPSGN, adding conversion to upper case for member name and version and a test against a zero-divide.
Moved to 15JAN87 on 3-Nov, nowhere else.

3687. November 3, 1986 HELP and INPUTS Eric
Corrected a branch address for quitting on page full. Before, a quit operation on HELP VERBS and the like would generate error messages and fail to deal with the new input line. Changed INPUTS to display more decimal places where possible. Changed subroutine AU1A to do these things.
Moved to 15JAN87 this date.

3688. November 3, 1986 INCALN:DAPC and CAPC Kerry
The variable FFTSZE was inadvertently left out of these include files. It's used to indicate if the Alliant-provided FFT routine work array requires initialization.
Moved to 15JAN87 this date. These changes were included on the 15OCT86 UNIX/ATPS installation tape.

3689. November 3, 1986 AIPGUNIX:ZSTRTA, ZSTRTB and ZSTOPA Kerry
ZSTRTA and ZSTRTB have been changed rather drastically. Both now call ZXUID which sets the effective user id to that of the ATPS login account. They now display the chosen POPS number in hex. Reserved terminals are now implemented in the case of ZSTRTA. ZSTOPA has been deleted since it was never anything more than a null program.
Moved to 15JAN87 this date. These changes were included on the 15OCT86 UNIX/ATPS installation tape.

3690. November 3, 1986

SYSUNIX:NDCODE.SED, APLUNIX:ZCH2R4

Kerry

NDCODE.SED is used via sed in the UNIX source code preprocessor (PP) to transform ENCODE and DECODE statements into Fortran 77 internal WRITES and READs followed and preceded by subroutine calls to perform the necessary copying from/to the CHARACTER array to/from numeric arrays of hollerith data. In order to handle error branching in ENCODE statements, the statement label involved, if any, is passed in the subsequent call to ZCH2R4 along with the IOSTAT return value. ZCH2R4 copies the internal file contents to the target of the original ENCODE. If both the IOSTAT return value is non-zero the statement label passed is non-zero, an alternate RETURN is performed. The way we had been passing the statement label was not in compliance with ANSI standard, but the Convex compiler was the first to complain. Instead, the statement label in the call to ZCH2R4 should have been prefixed with an asterisk and the dummy argument as coded in ZCH2R4 should have been a simple asterisk. Not all ENCODE statements contain the optional error branching, but the code transformer must be general enough to handle either case. NDCODE.SED now passes any statement label properly and, in those cases where there is no error branch, zero is passed instead. A new argument has been added to ZCH2R4 which is used to pass the statement label as before (i.e., as a simple integer) and this is used simply to indicate if the statement label passed in the ANSI standard fashion is legitimate (i.e., non-zero). Now for the best part. Convex supports ENCODE and DECODE, so this part of UNIX/AIPS never gets exercised at NRAO. The old versions of NDCODE.SED and ZCH2R4.FOR have been saved as NDCODE.SAV and ZCH2R4.SAV, respectively, in case the the ANSI standardized versions don't work. Death to ENCODE and DECODE! Moved to 15JAN87 this date. These changes were included on the 15OCT86 UNIX/AIPS installation tape.

3691. November 3, 1986

SHOW and TELL

Eric

We need some way to tell running tasks things. Therefore, I have created pseudoverbs SHOW and TELL with the same grammar as INPUTS and GO to display TELL parameters and to put them in a disk file. It will be up to us to code use of this file into the tasks separately and to document that use in the help files for both TELL and the task. The parameters are TASK and OPTELL to the verb TELL, plus normal adverbs to the tasks. To indicate that an adverb is used for both GO and TELL, the Inputs line must have an * in column 10. To restrict an adverb to the TELL operation on a task, put a ? in column 10. Also coded a new verb STQUEUE to display pending TELL operations. Changed:

NEWPARMS.OO1 — Added new adverb OPTELL to system RUB file.
POPSDAT.HLP — Added pseudoverbs and reserved verb numbers for SHOW and TELL and added new adverb OPTELL.
DAPL.INC — Added OPTELL.
CAPL.INC — Added OPTELL.
POLISH — Changed branch tests for these out-of-sequence pseudoverb numbers.
ZPHFIL — (VMS) Added TC to the list of system files.
HELPS — Add conversion of pseudoverb with argument to (hidden) verb for these two.
AU1A — Added new branch for SHOW; added code to skip non-TELL parameters and comments on SHOW and TELL-only parameters and comments on INPUTS.
AU2 — Added new branch for TELL; added code to skip non-TELL parameters and comments on TELL and TELL-only parameters and comments on TPUT and GO. Added code to display the TELL queues.
AU2A — Added code to skip TELL-only parameters on TGET.
VERBSB — Added code to treat TELL as an error in batch, changed RANCTD to AIPS in a comment.
VERBSC — Added code to treat TELL as an error in batch, changed RANCTD to AIPS in a comment.
FILINI — Added code to initialize the TC file.
FILAI1 — Added code to create and initialize the TC file.
FILAI2 — Added code to create and initialize the TC file.
TELL.HLP — Description (inputs and help).
SHOW.HLP — Description (inputs and help).
STQUEUE.HLP — Description (inputs and help) of TELL queue display.
Moved nowhere.

3692. November 4, 1986

SDCLN, APCLN, GTTELL

Eric

Changed SDCLN and APCLN to support SHOW and TELL in their help and Fortran files. Numerous parameters may be sent by TELL. SDCLN has an internal subroutine SDITEL to interpret the TELL parms and uses a new library routine GTTELL to fetch them. APCLN has a very similar internal routine. Also updated TELL.HLP.
Moved nowhere.

3693. November 5, 1986

Bugs

Eric

Corrected TABINI: it was not computing the disk requirements for the miscellaneous records correctly and hence, it would lead table copy algorithms (such as in TABSRT and TABMRG) to fail. Corrected PASS2: it was not printing error messages on several of the possible errors due to a bad branch address. Corrected SDCLN and APCLN: the computation of scratch file sizes was done incorrectly.
Moved to 15JAN87 this date.

3694. November 6, 1986 UVGET Bill
Changed to allow processing of first scan with only one visibility. This condition occasionally occurred and UVGET refused to proceed.
Moved to 15JAN87 this date.
3695. November 6, 1986 CSLGET Bill
Local variable CURTIM changed to R*8. A critical test was incorrectly failing due to truncation of the precision of the time.
Moved to 15JAN87 this date.
3696. November 7, 1986 LISTR Bill
New task. Does matrix listings of scan averages of amplitude, phase or rms of multi-source data files. Calibration and/or editing may also be applied. Also LISTR.HLP.
Moved nowhere.
3697. November 8, 1986 CALINI Bill
Many of the geometric observables were not being treated as arrays although they were in TABCAL. For multiple IFs, this was causing TABCAL to overwrite values. Also corrected to always read the keyword value pairs; this was only being done on READ.
Moved to 15JAN87 this date.
3698. November 10, 1986 FILLR Bill
Modified to write dummy CL table (zeroes and ones). Also corrected several errors in writing the index (IX) table. Also FILLR.HLP, DFLR.INC and CFLR.INC.
Moved to 15JAN87 this date.
3699. November 10, 1986 LISTR Bill
Corrected arguments to ZDCHIB for sorting. Also cleaned up a format.
Moved nowhere.
3700. November 10, 1986 FILLR Bill
Corrected to deal with case that the MODCOMP tape begins in the middle of a Format-2 record. Also modified to concatenate files on a tape. Also changed FILLR.HLP, D/CFLR.INC.
Moved to 15JAN87.
3701. November 11, 1986 CALIB Bill
Fixed several bugs: (1) Only tried to update catalogue header in the history routine for single source files. (2) CLBPA was using a bad address for initializing the reference antenna array and clobbering the array in GASOLV which told which antennas had data. (3) In GASOLV, the assumption had been made that the time associated with a index (IX) table entry was the start time; this has been corrected to use the time as the center time. (4) Initialization of the solution and "got antenna" arrays was moved to before the polarization loop. (5) The computation of the time interval to put in the SE table for phase-amplitude solutions has been corrected.
Moved to 15JAN87 this date.
3702. November 11, 1986 DBCON Bill
Modified to handle source numbers in multi-source tables. The source numbers in the second input are changed to be consistent with those in the first file and the source id random parameters are suitably translated. The source numbers in the version=1 CL and FG tables (if any) of the second input file are translated and appended to the end of a copy of the corresponding table from the first input table (if any). Also removed all complex arithmetic. Also changed: DDBC.INC, CDBC.INC, DBCON.HLP.
Moved to 15JAN87 on 7-Jan, 1987.
3703. November 11, 1986 FILLR Bill
Corrected logic which was causing multiple copies of some CL records to be written.
Moved to 15JAN87 this date.
3704. November 12, 1986 LISTR Bill
Fixed logic so that a list of antennas to exclude in listing will work correctly. Also fixed bug in encoding the data which occasionally caused the task to bomb. Now reads CH table to correct frequency given to that for the IF given. Added option to specify the number of columns printed in the range 4 to 10. Also LISTR.HLP.
Moved nowhere.

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3705. *November 13, 1986* FITTP *Bill*
FITEXT was failing to write the END card of a table header if it was the last card of a block. Fixed this and added SU, CH and CL to the list of "required" tables that will always be written if present.
Moved to 15JAN87 this date.
3706. *November 12, 1986* UVMAP *Eric*
Corrected bad reference to the grid file which prevented the *uv* distribution from being displayed on the TV.
Moved to 15JAN87 this date, nowhere else.
3707. *November 13, 1986* MX, VM, VTESS, UTESS *Eric*
Changed MX, VTESS, UTESS and VM, including the help files, to support TELL operations. Also changed VM, VTESS, UTESS, DVMM.INC and DVMT.INC to rename the function routines OPEN and CLOSE since those conflict with standard C-library routines on μ -VAXes. Also updated TELL.HLP.
Moved VM, VTESS, UTESS renames to 15JAN87 only.
3708. *November 14, 1986* SoUrce table change *Bill*
Modified the structure of the source (SU) table to have a value of IFLUX, QFLUX, UFLUX and VFLUX for each IF. For most existing routines, this was simply a matter of declaring the FLUX array to be sufficiently large. Affected subroutines: SOUINI, TABSOU, SOUFIL, SOURNU; affected tasks: ANCAL, DBCON, FILLR, LISTR, SPLIT, VLBIN (include file DVLB.INC only), CALIB.
Moved to 15JAN87 on Jan 7, 1987
3709. *November 17, 1986* GETNAN *Bill*
Fixed incorrect addressing for determining the number of subarrays; it was always using the number of files of the first type listed in the catalogue header.
Moved nowhere.
3710. *November 17, 1986* INPUTS *Eric*
Raised the default limits on numeric parameters to $\pm 10^{16}$ from $\pm 10^{10}$ in AU1A. Also fixed AIPSC which checks G0 limits.
Moved this fix to 15JAN87.
3711. *November 18, 1986* DATGET *Bill*
Increased the efficiency of DATGET for a short user specified TIMERANG by having DATGET return a return code of 4 and not read the remainder of the file when it encounters a time after the specified end time.
Moved nowhere.
3712. *November 18, 1986* LISTR *Bill*
Added column listing option which will work for single or source data files. Made local include files D/CLST.INC. Improved documentation in the LISTR.HLP; especially added an EXPLAIN section.
Moved nowhere.
3713. *November 18, 1986* ZOPEN *Eric*
The loop to retry on a file currently in use was getting a lot of the CPU. Raised the interval and lowered the count limit accordingly.
Moved nowhere.
3714. *November 18, 1986* More TELLs, better contours *Eric*
Changed ASCAL and ASCAL.HLP to support TELL; it can change the diagnostic print level and ABORT (QUIT is ignored). Changed CONDRW, CNTR, PCNTR, GREYS, MCUBE, QMSPL, CNTR.HLP, PCNTR.HLP, GREYS.HLP, MCUBE.HLP, and QMSPL.HLP to support TELL operations QUIT and ABORT. Also added these tasks to TELL.HLP. Added progress messages to the plot tasks to make the TELL more useful. CONDRW was changed to return error code 9 on QUIT and 10 on ABORT and to draw less dense dashed lines on large-field negative contours.
Moved nowhere.
3715. *November 19, 1986* ZPHFIL *Eric*
Added by Editors from checkout history file: Added TC file to the list of system-owned files in the APLUNIX: version.
Moved nowhere.

- 3716.** *November 19, 1986* SETLOC, NEWPOS *Eric*
Added tests to check for angle projections which are not supported. The routine proceeds, but issues a warning and uses pure linear, generic type axes. Kesteven pointed out a potential zero divide in NEWPOS in the ARC projection which I also corrected.
Moved to 15APR87 this date.
- 3717.** *November 20, 1986* BCAL2 *Bill*
Modified to copy all tables rather than trying to use EXTCOP to copy the AN tables (which no longer will work).
Moved to 15JAN87 this date.
- 3718.** *November 21, 1986* TV routines *Eric*
Corrected YINIT, DEA and V20 versions, to remove the multiplication by four in the initial OFM.
Moved to 15JAN87, nowhere else.
- 3719.** *November 21, 1986* SOUFIL *Bill*
Modified to remove redundant entries from antenna, source and calibrator lists.
Moved nowhere.
- 3720.** *November 24, 1986* Flag table version conventions *Bill*
Cleaned up the description and/or use of the flag table version adverb FLAGVER in a number of routines. Also cleaned up description of CL table usage.
UVFLG.HLP was corrected to say that FLAGVER=0 means create a new table. This is perhaps not the best default, but it is consistent with most of the rest of ATPS.
Flagging table to be applied: previously a value of FLAGVER=0 sent to the routines which apply the flagging table caused no flagging; this is inconsistent with the rest of ATPS. FLAGVER=0 will now mean use the highest numbered table and FLAGVER < 0 will mean no flagging. Affected routines: UVGET.FOR, CALIB.HLP, SPLIT.HLP, LISTR.HLP.
Moved nowhere.
- 3721.** *November 24, 1986* GAININ *Bill*
If the SH tables are not being applied to the CL table, the table pointed to by GAINUSE is now used rather than GAINVER.
Moved nowhere.
- 3722.** *November 24, 1986* LISTR *Bill*
Added option to get rms matrix in addition to amplitude or phase or amplitude and phase. Also cleaned up a few minor bugs in the labeling. Also LISTR.HLP.
Moved nowhere.
- 3723.** *November 25, 1986* CALIB *Bill*
If multiple sources are being used, then CLBIV is called rather than attempting to find a CC table to use.
Moved nowhere.
- 3724.** *November 25, 1986* SETGDS *Bill*
If the default CC table version number is requested, then the highest numbered table for each file is determined independently. Previously the highest numbered table for the first file was used for all subsequent files. If the requested table did not exist, UVSUB would subtract the image which was usually not what the user wanted.
Moved nowhere.
- 3725.** *November 25, 1986* UVSUB *Bill*
Modified so that NCOMP(i) < 0 means subtract no components from field i. For OPCODE='DIV' negative, NCOMP values still mean stop at abs(NCOMP(i)) or the first negative component, whichever comes first. Also changed UVSUB.HLP.
Moved nowhere.
- 3726.** *November 25, 1986* LISTR *Bill*
Fixed bug in LIST option which caused it to determine the number of sources in the SU table incorrectly.
Moved nowhere.
- 3727.** *November 25, 1986* SOURNU *Bill*
The dimensions of SUKOLS and SUNUMV were incorrectly set to 15 rather than 18. This was causing SOUINI to overwrite the LUH being used.
Moved nowhere.

- 3728.** November 25, 1986 WSL0D Eric/Bill
Added by Editors from the checkout history file: J. M. van der Hulst pointed out that `DWIN. INC` and `CWIN. INC` did not match the version of `WSL0D` and provided corrections. Bill then corrected the antenna file handling to the new tables format and made additional corrections to the include files.
Moved to 15APR87 as well.
- 3729.** November 25, 1986 APGN0T:BAKTP, INCS:*BTP, BAKTP.HLP Don
A new task — one which writes *ATPS* data files to tape using the host-dependent "backup" format (`BACKUP` under VMS, `tar` under UNIX). The task has almost the same adverbs as `FITTP`, plus the `OPCODE` adverb to control whether it is operating in its "BACK" mode or in its "INIT" mode (`BAKTP` always acts as though `DOE0T=TRUE` and therefore tapes must be initialized before first use with this task). The advantages of using `BAKTP` to record *ATPS* files, rather than using `FITTP`, are that `BAKTP` is often faster due to the fact that it writes binary copies of disk files (i.e., with no format conversion cost) and that it records *all* extensions associated with a slot (including, for example, machine-dependent plot files). `BAKTP` tapes are reloaded to disk using task `BAKLD` (see below).
Moved nowhere (the midnight job will do it).
- 3730.** November 25, 1986 APLVMS:ZBKTP1, ZBKTP2, ZBKTP3 Don
These three Z-routines do the actual work of `BAKTP` for VMS. They compute DCL command procedure files which cause the creation of scratch subdirectories under the directories specified by the VMS logical symbols `DA0n`. A variety of scratch files are created and destroyed in `DA0n` and the subdirectories. The VMS `BACKUP` program is invoked to write all of the files and extensions associated with an *ATPS* catalog slot to tape as a `BACKUP` saveset. The blocksize is 30720 bytes, which has a packing efficiency of 94% at 6250 bpi (but effectively less than 85% because of the error correction overhead of `BACKUP`). One special, and peculiar, advantage of task `BAKTP` over task `FITTP` under the VAX-VMS operating system is that the `BACKUP` program appears to execute with a higher priority than its invoking process. Experiments show that the `BAKTP` subprocess often uses more than 50% of the CPU time with a 100 inch/sec tape drive at 6250 bpi on a VAX-780. Of course, with such CPU loadings, only the invoking *ATPS* user is guaranteed to view the excellent real-time performance of `BAKTP` as a good thing!
Moved nowhere (the midnight job will do it).
- 3731.** November 25, 1986 APGN0T:BAKLD, INCS:*BKL, BAKLD.HLP Don
Another new task — one which reads the *ATPS* data files from a host-dependent `BAKTP` tape to disk. The task has almost the same adverbs as `IML0D`, plus the `OPCODE` adverb to control whether it is operating in its "LOAD" mode or in its "PRNT" mode (which produces an index of a `BAKTP` tape, reminiscent of the task `PRTP`). As with `BAKTP`, `BAKLD` generally will have a speed advantage over `IML0D` and `UVL0D`, plus the advantage of automatically supporting all *ATPS* extension files. For both `BAKTP` and `BAKLD`, the speed advantage is most noticeable when processing the largest files, where the process-initiation time is small compared to the tape motion time.
Moved nowhere (the midnight job will do it).
- 3732.** November 25, 1986 APLVMS:ZBKLD1, ZBKLD2, ZBKLD3 Don
These three Z-routines do the actual work of `BAKLD` for VMS. They compute DCL command procedure files which cause the creation of scratch subdirectories under the directories specified by the VMS logical symbols `DA0n`. A variety of scratch files are created and destroyed in `DA0n` and the subdirectories. The VMS `BACKUP` program is invoked to read all of the files and extensions associated with an original *ATPS* catalog slot from tape (as a `BACKUP` saveset) into a scratch subdirectory. Then a new *ATPS* catalog slot is created and the data file and its extensions are `RENAME`d into the new *ATPS* slot. As with `BAKTP`, the VMS implementation of `BAKLD` has a special speed advantage (for the invoking *ATPS* user) because the `BACKUP` utility appears to operate with higher-than-normal priority. The VMS implementation has yet another special advantage: the `BACKUP` tape format includes error detection and correction coding which allows `BAKLD` to recover from a wide variety of hardware errors that would cause failure in `IML0D` or `UVL0D`.
Moved nowhere (the midnight job will do it).
- 3733.** November 25, 1986 APLVMS:ZSHCMD Don
This is a new Z-routine which "spawns" a subprocess to execute a one-line command using the host command-language processor ("`SHCMD`" is derived from "Shell CoMmanD"). Of course, the single line can call for the execution of a file containing an arbitrarily-long command-language procedure, and that file can be computed by the calling task. The Z-routines of tasks `BAKTP` and `BAKLD` use this Z-routine to order the execution of various computed procedures and command strings.
Moved nowhere (the midnight job will do it).

- 3734. November 25, 1986** APLUNIX:ZBKTP1, ZBKTP2, ZBKTP3 *Don*
These three Z-routines do the actual work of BAKTP for UNIX. They compute Bourne-shell command procedure files which cause the creation and destruction of scratch files and of scratch subdirectories under the directories specified by the UNIX environmental symbols DA0n. The operation of these routines is as closely analogous to the operation of APLVMS:ZBKTPn as is possible. The UNIX "tar" program is invoked to write the files and extensions of an ATPS catalog slot. The output of tar is "piped" through the program "dd" in order to reblock it to a blocksize of 30720 bytes, just as for VMS. This gives an efficiency of 94% at 6250 bpi, and there is no error-recovery overhead. The "savezet" files produced by dd are delimited by tapemarks. Unlike BACKUP under VMS, the tar/dd combination does not execute with any special priority (except that AIPS1 and AIPS2 have an elevated priority on NRAO's Convex implementation). Also, dd appears to be somewhat expensive for the simple reblocking operation it is doing (probably too much generality in the code), and so we will need to code a special fast version when we get some time.
Moved nowhere (the midnight job will do it).
- 3735. November 25, 1986** APLUNIX:ZBKLD1, ZBKLD2, ZBKLD3 *Don*
Again, these Z-routines do the actual work of BAKLD for the UNIX implementation. Again, operation of the three routines is as analogous to the operation of APLVMS:ZBKLDn as is possible (in fact, the code is a transliteration, in general). The savesets are deblocked and unpacked using dd piping into tar. As with APLUNIX:ZBKTPn, the dd/tar combination enjoys no special priority advantage over other processes. Also, tar does not use any sort of special error detection and correction procedure, and so the present UNIX implementation of BAKTP/BAKLD does not have any reliability advantage over FITTP/IHL0D/UVL0D. If a special high-performance dd is devised, some consideration should be given to implementing a variation on BACKUP's error recovery techniques.
Moved nowhere (the midnight job will do it).
- 3736. November 25, 1986** APLUNIX:ZSHCMD *Don*
UNIX version of this Z-routine.
Moved nowhere (the midnight job will do it).
- 3737. November 26, 1986** CALIB *Bill*
Fixed problem with the weights in CLBPA. If multiple IFs and polarizations were processed with antennas edited out of some but not all the baseline weights would get zeroed for the absent data. In the following solutions where there was valid data, no solution would be made for the affected antenna, resulting in low signal to noise ratios for the other antennas. Also fixed problem with the way frequencies were averaged in each IF in GASOLV.
Moved to 15JAN87 this date.
- 3738. November 27, 1986** FILLR *Bill*
Increased the size of the record buffer to 64kwords (I*2). This required changing a number of internal variables from I*2 to I*4 in DMC.INC, CHC.INC. Also removed the explicit assumption of 2 characters per integer in packed strings. There may be problems on machines with a non integral number of characters per integer. Also included P band in list of known bands. Improved reading of antenna tables from ModComp files. Now allows specifying the maximum number of tape files to attempt to read. Changed FILLR.HLP.
Moved to 15JAN87 this date.
- 3739. November 27, 1986** Convex Z routines for FILLR *Bill*
The following Z routines were put in the Convex Z routine area:
ZRM2RL.C — Converts ModComp single precision.
ZDL2DL.C — Converts ModComp double precision.
ZRDHF.C — Cracks DMF Dec-10 tape byte order.
ZMCACL.FOR — Unpacks ModComp compressed ASCII buffer.
The data format conversion routines can be easily changed to convert to IEEE floating, ZRDHF may work on any system with a C compiler and ZMCACL will work on any machine which supports 8-bit BYTE variables as signed integers. The VAX ZMCACL.MAR has been replaced by the Fortran version.
Moved nowhere.
- 3740. November 28, 1986** UVGET *Bill*
Now, if the requested flag table does not exist, no flagging is attempted. The catalogue status is now changed from WRIT to READ after the initialization is done.
Moved nowhere.

3741. December 1, 1986 ITRIM Don
Function subroutine to determine the ordinal of the last non-blank character of a string. Used by tasks BAKTP and BAKLD, as well as in a number of *ATPS* utility programs.
Moved nowhere (the midnight job will do it).
3742. December 1, 1986 APGNOT:BAKLD Don
Removed ITRIM from BAKLD. Also arranged that internal subroutines BAKLDA and BAKLDB would be referenced in main program BAKLD in hopes that they will link properly on the Convex (the subroutines were previously called only by ZBKLDn and the UNIX/*ATPS* link procedure was not finding all APLSUB modules). Also changed D/CBKL.INC.
Moved nowhere.
3743. December 1, 1986 SUBIM Eric
Dropped INTYPE from program and inputs, increased the buffer sizes to 4096 floating, dropped ability to handle integer images, and corrected the history file formats. Changed to copy any tables extensions rather than just CC files. Also corrected SUBIM.HLP.
Moved nowhere.
3744. December 1, 1986 HGEOM, COORDT Eric
Dropped unused BADDISK parameter (there are no scratch files now). Added to history file information about second input image, corners, image size, and parameters. Changed help file, dropping BADDISK and adding information about 2nd input image. Changed handling of header: it is now based on the first input image, which is the one providing the data after all. Before, the output image could be very wrong, particularly in its information on axes 3-7. In fact, I wonder how it worked in some cases. Wrote new routine COORDT to transform between celestial, galactic, and ecliptic coordinates and revised HGEOM to use it rather than dying on mixed coordinate types. Added more progress messages and corrected the message levels. Corrected scrolling buffer code — it had an old error which could yield incorrect rows of blanked pixels. Also added counters of blanked pixels to make sure that people pay attention to the blanking. Corrected handling of edges by rounding the x, y to 1 sixtieth of a pixel which is the accuracy of the interpolation. Changed DXYG.INC and CXYG.INC to add the counters and to put the logical variables in the correct place in the common. Changed input parameter APARM(1) giving the interpolation order: 1, 3, 5, 7 mean linear, cubic, quintic and septic. Zero is taken to be 3 (cubic). Changed progress message frequency to depend on row length.
Moved nowhere.
3745. December 1, 1986 LGEOM Eric
Added corners, output size, and better documentation to history file output. Corrected bad test on INVERT parameter. Dropped BADDISK from help and code and dropped any reference to integer output images (and, hence, scratch files). Added test for rotation of rectangular pixels; the task now emits an error message and quits rather than make a mistake. Corrected scrolling buffer code and added counters of blanked pixels. Corrected handling of edges by rounding the x, y to 1 sixtieth of a pixel which is the accuracy of the interpolation. Changed input parameter APARM(6) giving the interpolation order: 1, 3, 5, 7 mean linear, cubic, quintic and septic. Zero is taken to be 3 (cubic). Added progress messages.
Moved nowhere.
3746. December 1, 1986 PGEOM Eric
Added corners, output size, and better documentation to history file output. Corrected bad tests on INVERT and SPIRAL flag parameters. Dropped BADDISK from code (it wasn't in the inputs!) and dropped any reference to integer output images (and, hence, scratch files). Corrected scrolling buffer code and added counters of blanked pixels. Changed input parameter APARM(6) giving the interpolation order: 1, 3, 5, 7 mean linear, cubic, quintic and septic. Zero is taken to be 3 (cubic). Added progress messages.
Moved nowhere.
3747. December 1, 1986 UVGET Bill
Removed bug inserted in last change to update catalogue status. Now uses common array CALTAB as buffer for CATDIR instead of UBUFF. UBUFF contained valid data which were getting clobbered.
Moved nowhere.
3748. December 1, 1986 CALIB Bill
Now gives a message and dies of unnatural causes if no data are found. Also fixed the time interval being written into the SN table for phase-amplitude solutions.
Moved nowhere.

3749. December 1, 1986 LISTR.HLP Bill
Clarified the description of the defaults for EIF and ECHAN; the default action depends on the OPTYPE.
Moved nowhere.
3750. December 2, 1986 AN10RS Bill
AN10RS now removes redundant entries from the antenna and baseline arrays such as when the user says ANTENN=17.
Moved nowhere
3751. December 2, 1986 TAPU.HLP Don
Added BAKTP and BAKLD to the list of tape utilities.
Moved nowhere.
3752. December 2, 1986 UVGET Bill
In an earlier change, I forgot to change the status of the file in the CFILES common to read when the catalogue status was changed to READ. Program using UVGET would then fail to clear the read status.
Moved nowhere.
3753. December 2, 1986 FLAGUP Bill
Changed tp mark the FG table as unsorted when an entry is added.
Moved nowhere.
3754. December 2, 1986 PGEOM Eric
Added some clarifications and explanations to the help file, replacing an incorrect explanation of the output image sizes. Corrected the handling of character strings in the image headers. Simplified inner loops by using precomputed parameters and ATAN2 rather than ARSIN. Corrected setting of output image size — it ignored the user on the *x* axis and could make much too large an image. Corrected all geometry computations to make the angle axis be the position angle on the sky when the input image axes are appropriate. This correction includes the signs and magnitudes of the axis increments (rectangular pixels are now okay) and any rotation already applied to the image.
Moved nowhere.
3755. December 5, 1986 UVGET Bill
When it was clearing the entry from the /CFILES/ common, it was looking for a WRITE entry whereas it had been changed to READ. This caused MAPCLR to complain about not being able to clear the catalogue flag.
Moved nowhere.
3756. December 5, 1986 LISTR Bill
Added option to list selected contents of an SN or CL table in tabular form OPTYPE='GAIN', added INEXT and INVER to adverb list. For OPTYPE='MATX', added a matrix average and sigma at the end of the matrix listings. Also now allow specifying an accumulation time for the matrix shorter than a scan. Also changed LISTR.HLP, DLST.INC and CLST.INC.
Moved nowhere.
3757. December 5, 1986 TABNDX Bill
Corrected precursor comments to say that the time is the center of the scan.
Moved nowhere.
3758. December 5, 1986 LISTR Bill
Added an option to list scan and source summaries; also changed LISTR.HLP.
Moved nowhere.
3759. December 6, 1986 SDCLN Eric
Corrected error in history card — the number of components compressed was incorrectly computed.
Moved fix (only) to 15JAN87 8-Dec, nowhere else.
3760. December 8, 1986 TABED Bill
Changed the default output file to the input file. This is a nonstandard convention, but what is wanted most of the time for TABED. Also changed TABED.HLP.
Moved nowhere.

- 3761. December 8, 1986** FNDSOU *Bill*
New subroutine: will return source numbers for a list of source names. It is like SOUFIL, but without all the other stuff.
Moved nowhere.
- 3762. December 8, 1986** SETJY *Bill*
New task: enters flux densities and/or calibrator codes in an SU table. Also SETJY.HLP.
Moved to 15JAN87 on Jan 7, 1987
- 3763. December 8, 1986** TV problems *Eric*
We have a problem: some TVs can turn on only one channel at a time. Then, if channel 1 is on and TVON(2) is received, channel 1 remains visible and the TV device knows only that channel 1 is on. A subsequent TVOFF(1) does nothing since, currently, the software does not remember that channel two is then supposed to come on. Therefore:
YLOWON# — (YGEN) Changed to test bits 1 through NGRAY only and return the zero-relative least bit on. If there are no bits on, it returns 0; if there is some bit > NGRAY on, it returns NGRAY.
YDEA.INC — Added parameter for channel request save area.
YINIT — (YDEA) Corrected comment.
YLUT — (YDEA) Changed to test only grey channels on read.
YSPLIT — (YDEA) Changed to do correct test on YLOWON output, to save the requested channels, and to return the requested rather than actual channels. Removed 72 TAB characters!
YSPLIT — (YIVAS) Changed to save and return the requested channels rather than the actual ones.
YLUT — (YV20) Fixed test on output of YLOWON.
YSPLIT — (YV20) Changed to save and return the requested channels.
Moved to 15APR87 this date.
- 3764. December 8, 1986** IMGPL *Brian Glendenning*
Initial version of 2 new ATPS plot packages have been installed. These packages plot on Imagen 300 dpi laser printers. The two tasks are: IMGPL: This deals with the Imagen in "vector" mode. This routine handles all plots except grey-scale plots. Note that Imagens with early firmware releases can only handle plots of a certain complexity in vector mode before they die, even though they may have lots of memory left. So if your plots are too complex, or you need grey-scale, use PRIMG. If you have a late enough version of the firmware, turning pre-rasterization (see Imagen documents) should solve the problem.
Moved to 15JAN87 as well.
- 3765. December 8, 1986** PRIMG *Brian Glendenning*
PRIMG: This deals with the Imagen in a quasi-rasterized form; the parts of the plot that are not blank are held in rasterized patches, so line plot files are kept to a reasonable size. The grey-scale is currently dumb, using the PRTPL (Versatec) algorithm. No quick modes yet. To do a full size grey-scale takes about 8 cpu minutes on a VAX 8600. These routines are currently VMS-specific, although they should be ported to a Sun-3 (and hopefully the rest of the UNIX world shortly thereafter) since the University of Toronto now has a dedicated Sun-3 for ATPS. These tasks are preliminary, and will be merged into one task with the best features of both, and with grey-scale quick modes, in the near future. These routines require that the logical name IMGQUE be defined (use the same method you would use to define QMSQUE for QMS laser printers), and that you have the IMPRINT spooling software that should have come with your Imagen.
Moved to 15JAN87 as well.
- 3766. December 8, 1986** PRTDR *Bill*
Fixed bad branch in CATIO error test.
Moved to 15JAN87 this date.
- 3767. December 10, 1986** Gridding *Bill*
There was an error in the gridding routines for bandwidth synthesis which caused the first weight in a set of channels gridded at a time to be used for all the channels. This was a problem if channels other than the first were extensively edited.
QPSAP:QGRD4 failed to increment the pointers in the data arrays if a visibility was flagged. This caused all the following visibilities in the same call to be ignored.
UVGRID was using the frequency of the first channel in a group being gridded together to determine the highest and lowest labeled value of u rather than the lowest frequency in the group. This caused a minor, but erratic distortion of the effective gridding convolution function.
Affected files: QNOT:UVGRID, QPSAP:QGRD4, QPSAP:Q1GRD, QFPS:AP1GRD.VFC (and the Q120B: and Q5000: Fortran files derived from it).
Moved to 15JAN87 this date.

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3768. December 11, 1986 FTQTAB Bill
Changed to use the parameter value of MAXIF, the maximum number of IFs, in determining an error condition.
Moved nowhere.
3769. December 11, 1986 CLUPDA Bill
Streamlined handling of single source files with no smoothing.
Moved nowhere.
3770. December 11, 1986 CHNDAT Bill
Now does something appropriate if no CH table is needed by the file, i.e., there is no IF axis. On read, nominal values are returned and, on write, nothing is done.
Moved to 15JAN87 this date (if I'm left alone long enough to).
3771. December 11, 1986 GAININ Bill
Removed defective test to see if the IF axis was present. This test is now done in CHNDAT.
Moved to 15JAN87 this date.
3772. December 11, 1986 UVGET Bill
Fixed not to return an invalid, nonzero return code under some circumstances if no flag table was found.
Moved to 15JAN87 this date.
3773. December 11, 1986 SPLIT Bill
Modified to work on single source data. Should now apply an SN table or nonsource selection criteria. Also SPLIT.HLP.
Moved to 15JAN87 this date.
3774. December 11, 1986 SOUINI Bill
Corrected error message; it was talking about the FLAG table.
Moved nowhere.
3775. December 11, 1986 ZPHFIL Eric
Corrected format for TEK devices > 10. Such device numbers are used for "remote" TEKs, i.e., the user's terminal is the graphics device. Made this change also to the UNIX version — the logical there was called REMOTTn. The UNIX versions of ZWHOMI and AIPS.COM and, maybe, ZOPEH need to be fixed as well.
Moved to 15JAN87 this date, also Goddard, STSci.
3776. December 11, 1986 AIPSC Eric
Corrected CU2 — I forgot to add the SHOW/TELL business to this version which checks G0 parameters.
Moved nowhere.
3777. December 11, 1986 VMS Fortran Options Eric
For some reason, our VAX is configured with NOSYNTAX as the default /STANDARDS setting while most VAXes, including those at the VLA, have default SYNTAX. Changed the AIPS definition of ZZFORTRAN in OPTIONS.COM to specify NOSYNTAX (on non-dirty compilations). Those of you who routinely use DIRTY in compiling are hereby requested to stop doing so.
Moved to 15JAN87 this date, nowhere else.
3778. December 11, 1986 TVROAM Eric
TVROAM was making funny lines through the middle of images on the new magnifications (i.e., factors 3, 5, 6, 7). Changed the computation of the scroll, which I hope will help, but can't test locally due to the lack of an IVAS.
Moved nowhere — should go to NEW.
3779. December 12, 1986 CLIP Bill
Modified to use ALLTAB to copy tables (this was missed somehow). Also added adverbs BIF and EIF to allow specification of the IF to CLIP. Also changed CLIP.HLP, D/CCLP.IEC.
Moved to 15JAN87 this date.
3780. December 13, 1986 Further IF conversions Bill
UVFHD and UVDIF were modified to check a single specified IF using the adverb BIF. Also modified SETVIS to set the pointers for a single IF; this required a change to the call argument. Also changed: UVFHD.HLP, DUVF.IEC, CUVF.IEC, UVDIF.HLP, DUVD.IEC, and CUVD.IEC.
Moved nowhere.

3781. December 15, 1986 DESCN, ASCOR Bill
Added ALLTAB to copy tables instead of EXTCOP to copy AN tables. These slipped through the big changeover and failed to copy any tables.
Moved to 15JAN87 this date
3782. December 16, 1986 LISTR Bill
Added trap in COLSET for the case of no baselines specified. This bug was causing the 'LIST' option to do a zero divide if no valid baselines were specified.
Moved nowhere.
3783. December 16, 1986 UVPLT Bill
Added adverb BIF to allow selection of the IF to be plotted. Also UVPLT.HLP, D/CVVP.INC.
Moved nowhere.
3784. December 16, 1986 AN10RS Bill
Fixed bug in determining baselines from adverb arrays passed; only the first element in ANTENNAS or BASELINE was being passed. Baselines also were not being specified in the correct orientation; i.e., the first antenna number could be larger than the second. These bugs affected the performance of UVFLG.
Moved to 15JAN87 this date.
3785. December 16, 1986 VBPLT Bill/Lars Baath
Modified model uv computation routine to work for the VLA or VLBI if BPARM(10) is set correctly. Added BIF to allow specification of the IF to be plotted. Replaced APARAM with TIMERANGE, STOKES, ANTENNAS and BASELINE. This allows more flexibility in specifying the baselines to be plotted. Also VBPLT.HLP, D/CVBP.INC.
Moved to 15JAN87 this date.
3786. December 18, 1986 Date displays Eric
Added more error handling to prevent bad dates from making bad output strings from DATDAT and TIMDAT.
Moved to 15JAN87 this date.
3787. December 19, 1986 LISTR Bill
Added trap in LIST option for no baselines specified. In GAIN option, fixed bug which caused the time and source info to be returned for the last time.
Moved nowhere.
3788. December 19, 1986 CALIB Bill
Fixed several bugs in handling multi-channel, single source data. Now CLBSEL is always called to select data for the solutions. Cleaned up time labels for solutions and added messages about the general progress of the task.
Moved to 15JAN87 this date.
3789. December 19, 1986 VISDFT Bill
Fixed bug for point model when only RR and LL data were present.
Moved to 15JAN87 this date.
3790. December 19, 1986 UVINT.VFC Bill
This VFC routine was losing the loop count for Stokes correlators if multiple channels were processed. Also changed the derived versions Q120B:UVINT.FOR and Q5000:UVINT.FOR.
Moved to 15JAN87 this date.
3791. December 22, 1986 QCOS:QPHSRO.FOR Bill
Moved work vector used to after the end of the secondary AP memory allocation so that routines using QPHSRO could use the secondary AP memory.
Moved nowhere.
3792. December 22, 1986 BCAL2 Craig
Fixed a format statement that prevented proper operation on the Convex. Also removed nonstandard F77 READONLY from OPEN statement.
Moved nowhere.

3793. December 22, 1986 LISTR Bill
Fixed autoscaling bug which caused numbers to run together in some listings. Also fixed bugs which caused some headings to be listed and fixed not to print completely blank matrices.
Moved nowhere.
3794. December 22, 1986 UVDF Eric
Corrected mishandling of **IN2DISK** which required that both files be on the same disk.
Moved to 15JAN87 this date, nowhere else.
3795. December 24, 1986 LISTR Bill
Yet another attempt to get the autoscaling right.
Moved to 15JAN87 on Jan 7, 1987.
3796. December 29, 1986 Sequential devices Eric
Changed:
ZOPEH — (VMS) Dropped all opening of tapes.
ZTPOPH — New: (VMS) Is intended to open sequential devices: tapes and some new kind of disk file. At the moment, the disk is still our old QIO format. Added argument for type of I/O desired (read or write/read).
ZMIO — (VMS) Dropped all I/O to tapes.
ZTPMIO — New: (VMS) I/O to sequential devices — is now just ZMIO with the special TEK I/O and the record number argument dropped.
ZWAIT — (VMS) Dropped all waiting for tape I/O.
ZTPWAT — New: (VMS) Waits for sequential I/O, returns the number of bytes read.
ZCLOSE — (VMS) Dropped all tape I/O handling.
ZTPCLS — (VMS) Do ZCLOSE for tapes (including hidden disk file).
ZBYMOV — (VMS) This moves 8-bit bytes not half-word AIPS "bytes." Changed precursor comments.
ZFIO — (VMS) Added trap for tape I/O and message prohibiting it. Removed tape I/O error handling.
TAPIO — Corrected error: the difference between AIPS "bytes" and 8-bit bytes was not accounted and must be here. All arguments to TAPIO are in 8-bit bytes. Corrected other minor things, cleaned up typing, changed to use the new Z routines for tapes, etc.
Moved nowhere.
3797. December 29, 1986 Tapes Eric
Several tape handling routines had errors or changes too:
FNDEOT — Changed from ZFIO to ZTPMIO/ZTPWAT.
RWTAB — Changed tape buffer name, made minor typing changes.
TABLIH — Changed tape buffer name to make its use clear, increased work array to handle longer rows, and corrected comments.
SKPBLK — Treated a FITS header with trailing blank card images as a serious error instead of just an indication that a new TAPIO call is needed. Corrected typing and dropped the error messages. Why have we gotten away with this? Changed call sequence to let SKPBLK do the needed read of the tape (plus conversion to local character). Dropped assumption of 2 characters/integer.
PTF3D — The addressing confused AIPS and 8-bit bytes. Made the addressing both simpler and more likely to work on Crays and other > 16 bit machines.
TPIOHD — Cleaned up a little.
EXTREQ — Changed call sequence to use separate tape and work buffers. Changed calls to SKPBLK.
TABHDR — Changed call sequence to use separate tape and work buffers. Changed calls to SKPBLK which now does all the needed tape I/O. Fixed up error handling.
MAKTAB — Changed call sequence, adding buffer size argument.
SKPEXT — Corrected error handling. Changed call sequence to provide both buffers and flag to say whether header has already been processed. Changed to use SKPBLK to do header I/O and get non-blank card. Dropped excess common containing an independent version of the task name.
SKPTAB — Old subroutine, no longer correct or used, was deleted.
EXTHIS — Dropped excess common containing an independent version of the task name. Changed to standard includes for the tables — this routine had local, incorrect declarations for everything and has been messing up the histories produced by UVLOD.
GTF3D — Changed precursor remarks (it's 8-bit not AIPS bytes) and addressing into the I/O buffer.
R3DTAB — Changed addressing onto the I/O buffer and a variable name (to make its use clearer).
Moved nowhere.

3798. December 29, 1986

FITTP

Eric

Changed POPSDAT.HLP, DAPL.INC, and CAPL.INC to add the adverb FORMAT and created FORMAT.HLP. Changed FITTP.HLP, dropping BLC and TRC (they are seldom used and too dangerous) and adding FORMAT to specify blocking and the choice of 16- or 32-bit integer or 32-bit floating for the image or *uv* data. Changed FITTP to do this. Corrected handling of tape buffers to have a separate buffer for the tape record in local forms. Changed it to call TAPIO to flush the buffers at the end of each file. Added BLOCKED = T keyword to the headers. Corrected handling of history cards — 8 characters of the next card were getting placed also at the end of the current one. Corrected handling of OUTFILE character string. Corrected handling of tables keywords — there were errors in rounding, in handling logicals, in transmitting I*2 values for ASCII tables, and in sending the sort order. Also changed D/C/EFTP.INC.

Moved nowhere.

3799. December 29, 1986

IMLOD

Eric

Revised DHLT.INC and CHLT.INC to make a large tape buffer. Changed IMLOD to (1) use the large tape buffer and declare its size in 8-bit bytes, (2) move the data during conversion to host forms to another buffer, (3) handle INFILE correctly (it's packed to begin with) including unpacking it for messages, (4) not assume 2 characters/integer in moving unknown header cards to history file, (5) call SKPBLK, EXTREQ, TABHDR, MAKTAB, and SKPEXT with the new call sequences, (6) use the same tape and work buffers throughout, (7) read IEEE floating images, and (8) handle errors in extension files more forgivingly and correctly.

Moved nowhere.

3800. December 29, 1986

UVLOD

Eric

Revised DUIH.INC and CUIH.INC to make a large tape buffer. Changed UVLOD to (1) use the large tape buffer and declare its size in 8-bit bytes, (2) move the data during conversion to host forms to another buffer, (3) handle INFILE correctly (it's packed to begin with) including unpacking it for messages, (4) use TAPIO to close the tape I/O everywhere, (5) allow SKPBLK to do the tape I/O everywhere instead of several I/O places possible and blank header cards treated as "unknown", (6) not make the mistake of allowing random parameters to be blanked, (7) test buffer limitations rather than simply overflowing buffers (8) move data correctly between buffers rather than assuming 8 bits per local *AIPS* byte, (9) call SKPBLK, EXTREQ, TABHDR, MAKTAB, and SKPEXT with the new call sequences, (10) use the same tape and work buffers throughout, (11) read IEEE floating images, and (12) handle errors in extension files more forgivingly and correctly.

Moved nowhere.

3801. December 29, 1986

Tape verbs

Eric

For the tape verbs, changed:

AU4 — Changed to use TAPIO to open, close, backfile the tape. Changed calls to TPHEAD to a big buffer and the call sequences to FWRITE and DWRITE.

DWRITE — Changed typing a little.

FWRITE — Changed call sequence to handle TAPIO buffers, pointers.

UWRITE — Changed call sequence to handle TAPIO buffers, pointers.

MSGHDR — Changed to handle other new FITS types.

TPHEAD — Changed to use TAPIO.

Moved nowhere.

3802. December 29, 1986

PRTP

Eric

Changed PRTP and DPTP.INC and CPTP.INC to handle blocked FITS tapes, using a large tape buffer and a separate buffer for the tape logical record converted into local forms. Previously, the conversion into local forms in the actual I/O buffer could wipe out the rest of the data (the next logical record) in the I/O buffer. This is only significant with blocked FITS tapes.

Moved nowhere.

3803. December 29, 1986

Tape tasks

Eric

Also changed EXIND, EXFND, IBMTP, UVEXP, and EXPND to declare their tape buffers in 8-bit bytes as required by TAPIO. Cleaned up typing a little in EXIND. Corrected an error branch in IBMTP and added a line to prevent extra ends-of-file in the wrong place when TAPIO is called to CLOSE the tape. In UVEXP, corrected error handling and dropped the ZTAPE call to write end-of-file since TAPIO will do that. In EXPND, changed ZTAPE calls to write end of files into TAPIO flush calls. Changed AVTP to call the new tape Z routines. WSLD, FILLR, and some utility programs remain to be done (they will fail if linked).

Moved nowhere.

3804. December 30, 1986 Sequential devices Eric
Changed:
ZOPEN — (UNIX, BERK, CVEX, ALLN) Dropped all opening of tapes and changed the wait loop timings to use less CPU time.
ZTPOPN — New: (UNIX, BERK, CVEX, ALLN) Is intended to open sequential devices: tapes and some new kind of disk file. At the moment, the disk is still our old QIO format. Added argument for type of I/O desired (read or write/read) and dropped the MAP argument since all tape I/O is double-buffered.
ZBYMOV — (UNIX) This moves 8-bit bytes *not* half-word ATPS "bytes." Changed precursor comments.
ZFIO — (UNIX) Added trap for tape I/O and message prohibiting it. Removed tape I/O call and error handling.
ZMIO — (UNIX) Dropped all I/O to tapes.
ZTPMIO — New: (UNIX) I/O to sequential devices — is now just ZMIO with the special TEK I/O and the record number argument dropped.
ZWAIT — (UNIX) Dropped all waiting for tape I/O.
ZTPWAT — New: (UNIX) Waits for sequential I/O, returns the number of bytes read.
ZCLOSE — (UNIX, BERK, ALLN) Dropped all tape I/O handling.
ZTPCLS — (UNIX, BERK, ALLN) Do ZCLOSE for tapes (including hidden disk file).
Moved nowhere.
3805. December 31, 1986 UNIX Zs, TAPIO Eric
Changed ZXTPIO.C (UNIX, UTS, SUN) and ZQIO.C (UNIX) to put the number of bytes read/written in the FTAB location reserved for that information. This is needed to make the tape I/O work. Added tests to TAPIO for LBYTES ≤ 0.
Moved to the CV Convex this date, nowhere else.
3806. January 3, 1987 TAPIO Eric
Corrected two bugs: the test on number of bytes failed to take into account the dummy 0-byte initial write transfer and the FLSH operation did not clear enough parameters to tell the routine to reinitialize everything on the next WRIT call. Fixed. Also added line before TAPIO close call in AU4 to avoid waits for non-existent I/O on errors.
Moved nowhere.
3807. January 5, 1987 SDCLN Eric
Bug corrected: in APCLN mode, the test for completion due to number of iterations was done differently in two different spots, leading to conflicts if a CC merge had been performed.
Moved fix to 15JAN87, nowhere else.
3808. January 5-6, 1987 Tape programs Eric
Fixed for the new tape system:
AIPMAN — Changed to call ZTPOPN, ZTPMIO, ZTPWAT, and ZTPCLS instead of ZOPEN and ZFIO. Fixed it to call ZQMSIO to close QMS outputs and to assume the tape has FITS-standard characters not local ones.
BAKLD — Changed ZOPEN call to ZTPOPN, added ZTPCLS call before DIE. Added copy of ITRIM to end to avoid link edit failure.
BAKTP — Changed ZOPEN call to ZTPOPN, added ZTPCLS call before DIE, correcting error handling.
EXPTAP — Moved to LOCAL.PGM area. This routine cannot work until ZGTDIR knows how to access the source code in the new directory structure and is probably made obsolete by EXPFIT. It should be resurrected some day to make a machine-independent source-code-to-tape facility available again.
GRITP — Changed ZOPEN to ZTPOPN, ZFIO to ZTPMIO/ZTPWAT, and ZCLOSE to ZTPCLS.
GRTOTEX — Changed ZOPEN to ZTPOPN, ZFIO to ZTPMIO/ZTPWAT, and ZCLOSE to ZTPCLS.
IMPFIT — This program cannot use standard Z routines since it is designed to read them in from tape (the old chicken and egg story). Cleaned up typing, added a local Z routine in UNIX form to do the file opening. The file names come from tape in UNIX notation and must be converted to local notation. We should write VMS version of these as documentation, too. Also fixed up the commons: CHARACTER variables must be in commons by themselves.
RDFITS — Changed to read blocked tapes with the new Z routines and to display and count the logical records appropriately.
PRNTHN — Changed to use the new Z routines. This is the only remaining program to use ZGTDIR and will, thus, work at best only in some of its modes. It deserves more work.
Moved nowhere.
3809. January 6, 1987 FILLR.HLP Bill
Corrected misspelling of CL (as CT) table in inputs section. Also a few other minor improvements.
Moved to 15JAN87 on Jan, 7 1987.

3810. January 6, 1987 CALIB Bill
Made a number of fixes to minor problems: (1) the key written in the history file for CPARM(2) was corrected, (2) CPARM or DPARM was not written in the history file if not used, (3) if no point model or CLEAN component model was specified, then the source flux densities in the SU table are used as the source model.
Moved to 15JAN87 on Jan 7, 1987.
3811. January 6, 1987 GAININ Bill
Changed to disallow modifying CL table 1.
Moved to 15JAN87 on Jan 7, 1987.
3812. January 6, 1987 CLUPDA Bill
Fixed problems with handling default CL table version numbers.
Moved to 15JAN87 on Jan 7, 1987.
3813. January 6, 1987 FILLR Bill
Corrected bugs which caused CL table entries to be made twice per integration time rather than using the user-provided interval. Changed the buffer size sent to TAPIO in FDVEC(3-4) to be in 8-bit bytes rather than AIPS bytes.
Moved to 15JAN87 this date.
3814. January 7, 1987 TAPIO Eric
The response to an end-of-file was inadequate: it set the I/O "off", but then the close call attempted a wait on the last buffer and exited on the resultant end-of-file. Changed the error handling in the fairly complex TAPIO close sequence to avoid the wait on all errors including end-of-file and to do the close even when other errors arise.
Moved nowhere.
3815. January 7, 1986 SDCLN Eric
The SDICLN routine had an addressing bug which affected CLEANs having CLEAN box XMI# not equal YMI#. This mostly worked after a fashion, but could blow up somewhere eventually. Also reworded help file a little.
Moved to CV Convex, 15JAN87 this date, nowhere else.
3816. January 7, 1987 PRTMSG Eric
Fixed up error tests to avoid quitting inappropriately.
Moved to 15JAN87 8-Jan, nowhere else.
3817. January 8, 1987 WSLOD Eric
Changed program to use TAPIO, cleaned up the typing a lot, declared over 50 undeclared variables, removed CAANT. INC which is no longer supported, changed the assumption that there are always two disks, renamed subroutines, etc. I cannot test all this, however, since we have no WSRT tapes. WSLOD remains very VMS-specific because of its dependence on the VMS formats on the tape being the same as the formats on the host (byte swap, floating point, etc.).
Moved nowhere.
3818. January 8, 1987 VMS procs Eric
Corrected the installation proc ICREDPT.COM; it was writing two versions of YPG#OTOPT.OPT rather than one plus one of YPGVMSOPT.OPT. Changed COMRPL.COM and COMLNK.COM (SYSVMS and SYSLOCAL versions) to restrict the wildcard directory lists to Fortran and Macro files. Changed COMPILE.COM to convert the file name to AIPS_ROOT:[date]. etc. rather than AIPS_VERSION:[etc. so that the debugger can find the real file that was used in the present load module. All of these suggestions were provided by Mark Calabretta of CSIRO in complete detail. He has my thanks.
Moved ICREDPT to 15JAN87 this date, nowhere else.
3819. January 10, 1987 Tape stuff Eric
Fixed:
TAPIO — Bugs for variable-length records: the code never converted the lengths to local integers so both write and read were messed up. It also picked up the length for writes from the front of the buffer not the front of the current half of the buffer. Also the CLOSe section did not test for the file still being open.
PRTTP — Export format reading still had a TBIND where it shouldn't leading to an error and an infinite loop. Corrected both.
UVLDD — Corrected error handling and close calls for export format reads.
Moved nowhere.

3820. January 12, 1987 Tapes Eric
Changed FITTP to support the FORMAT parameter as advertised: it will write blocked FITS tapes in 16- or 32-bit integer format. It can also write 32-bit IEEE floating point, but that capability is currently restricted due to the lack of an international agreement on the subject. This change required corrections to FITTP.HLP, CFTP.INC (missing parameters), IML0D (no max/min for IEEE), UVL0D (bad data type for I*4), and VKEY.INC (have BITPIX passed properly).
Moved nowhere.
3821. January 14, 1987 FILLR Bill
Added some tolerance for parity errors. The current integration (or average) is lost, but it will continue for 50 parity errors and then pretend that it is an end of file. When FILLR is finished, it tells the number of parity errors encountered, if any. Also changed D/CMC.INC.
Moved nowhere.
3822. January 14, 1987 ANCAL Bill
Fixed problem in ZAPEXT which zeroed a random word in the catalogue header.
Moved the 15JAN87 this date.
3823. January 14, 1987 TAPIO Bill
Fixed bug which was causing TAPIO to reset the blocking factor after a parity error.
Moved nowhere.
3824. January 14, 1987 CALIB.HLP Bridle/Bill
Added EXPLAIN section.
Moved to 15JAN87 this date.
3825. January 14, 1987 INCCOS:*HLP.INC Kerry
These are special include files developed as part of last port to COS (15JUL85), but were not migrated back to CVAX. Of course, this went undiscovered until the current port and had to be recovered from an old backup tape.
Moved nowhere.
3826. January 14, 1987 APLUNIX:ZCH2R4, SYSUNIX:NDCODE.SED Kerry
ZCH2R4 had previously been changed to handle alternate RETURNs according to the ANSI standard, however, the proper preprocessing of ENCODE statements containing error branching was not possible. Similarly, NDCODE.SED (used to preprocess ENCODE/DECODE statements) has been restored to its previous form (actually it never got changed because PUTBCK could not swallow it and the manual copy never got done). The old form of ZCH2R4 had been saved under ZCH2R4.SAV and has now been deleted. ZCH2R4 now makes no attempt to process alternate RETURNs upon encountering an I/O error. We will simply have to wait until ENCODE/DECODE statements are converted to ANSI-standard internal WRITE/READ statements.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/ATPS installation tape).
3827. January 14, 1987 APLUNIX:ZQMSIO and ZTOPEN Kerry
In the course of preprocessing ENCODE/DECODE statements into internal ANSI standard WRITE/READ statements, a variable is declared at the beginning of each program unit for use with IOSTAT. ZQMSIO and ZTOPEN had the same variable already declared, which caused their compilation to fail. To avoid this, the problem variable was simply renamed.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/ATPS installation tape).
3828. January 14, 1987 INSUNIX:INSTEP* Kerry
These files represent the automated phase of the UNIX/ATPS installation process. They are Bourne shell scripts with names INSTEP2, INSTEP3 and INSTEP4. The name INSTEP1 is being reserved in hopes of making some of the prerequisite tasks more automated. INSTEP2 performs all subroutine compilations and object library building. INSTEP3 compiles and links the subset of programs/tasks required to install ATPS to the level where the DDT ("Dirty Dozen Test") can be run. This is recommended as a sanity check before proceeding with INSTEP4 which will attempt to compile and link all possible programs/tasks in the ATPS system.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/ATPS installation tape).

3829. January 14, 1987

SYSUNIX files

Kerry

Various improvements and fixes were made to the generic UNIX system files, including:

- AIPS — Implemented proper assignment of Tektronix output device for "REMOTE" plus installed the hooks for multi-TV device systems.
- AREAS.DAT — Defined new areas.
- AREAS.CSH — Paraform C shell script generated from new AREAS.DAT.
- AREAS.SH — Paraform Bourne shell script generated from new AREAS.DAT.
- FC, CC, AS — Generalized command line file specification including "@" files and their checkpointing. Also added preprocessing capability and decision logic to allow standalone use (i.e., not merely as a slave procedure).
- COMLNK — Added "@" file checkpointing.
- COHRPL — Added "@" file checkpointing.
- CREADIR — Spiffed up.
- INCS.FOR — Updated to test new INCLUDE files for potential common block alignment errors.
- INCLUDE.FOR — Renamed from INCLUDE.F.
- LIBR — A new procedure that serves as the AIPS system object librarian. It will build new object libraries from a collection of object modules or update an extant object library. It locks the object library being built/updated in order to prevent collisions. This function used to be coded as part of the procedure LINK.
- LIBR.DAT — The center of the UNIX/AIPS programming universe. It now maps the universe in terms of AIPS programming "logicals" rather than hard coded pathnames (a neat trick under UNIX).
- LIBS — Revised to echo the corresponding link list for a given source code directory in terms of the logicals mapped out in LIBR.DAT. This is merely a utility to facilitate the creation of ".OPT" link files.
- LINK — Revised to handle new form of ".OPT" files and also invokes LIBR to perform any requisite object library updating prior to linking programs (i.e., the notion of LIBR used to be part of LINK). Also checkpoints any "@" files being used to drive it in stand alone mode.
- LOGIN.SH — Fixed error in line continuation syntax that resulted in misdefined \$CDOLD, \$CDNEW and \$CDTST "symbols".
- MAKEAT — A utility to generate "@" files. Revised to accept environment variable names rather than their definition, all in the interest of mapping things via logical names rather than hard coded logical values. Also changed it to regard NOTST as a "parallel" directory tree rather than a sub-tree of the same structure such that "MAKEAT APLPGH" would not generate an "@" file containing NOTST source code pathnames.
- PPTST.FOR — A demo program for testing the preprocessor, in particular ENCODE/DECODE transformations. Cleaned it up so that it would actually compile.
- SEARCH — Revised to handle mapping of the system source code area definitions as programming "logicals" rather than directory pathnames.

Much of the above was included on the 15OCT86 UNIX/AIPS installation tape (with the exception of the AIPS startup procedure changes), but was not migrated back to CVAX until now.

Moved all to 15JAN87 this date (also made it on 15OCT86 UNIX/AIPS installation tape).

3830. January 14, 1987

Moved SYSCVEX Files

Kerry

Files formerly stored in SYSCVEX that were actually NRAO Convex specific have been isolated into a new areas called SYSNRA01 (Charlottesville Convex) and SYSVLAC1 (VLA Convex). These amount to the SYSLOCAL directories for the respective machines. The SYSVLAC1 contents are identical to SYSNRA01 for the moment, since the recent AIPS port to the VLA Convex was a straight copy of the Charlottesville Convex system.

Files moved from SYSCVEX to SYSNRA01 and SYSVLAC1 include:

AIPS.	AREAS.CSH	ASSNLOCAL.SH	CHAIPS.C	LIBR.DAT
QMSLAND.	QMSLAND.HDR	QMSPORT.	QMSPORT.HDR	SPINCVAX.
TOUPPER.SED	VERSATEC.	ZXLPR.T		

New files added to SYSNRA01 and SYSVLAC1 include:

AIPGUNIX.OPT	AIPS.	AREAS.CSH	ASOPTS.SH	ASSNLOCAL.SH
CCOPTS.SH	CHAIPS.C	DIRTY..	ENCODE.SED	FCOPTS.SH
INCS.SH	LDOPTS.SH	LIBR.DAT	PP.	QMSLAND.
QMSLAND.HDR	QMSPORT.	QMSPORT.HDR	SPACE.	SPACE.CSH
SPACE.FOR	SPINCVAX.	TOUPPER.SED	UHAREAS.SH	UHDC.L.SED
VERSATEC.	VMS.FF	ZDIFF.	ZQMSCL.CVAX	ZXLPR.T
ZXLPR.T.QMS	ZXUID.C			

Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/AIPS installation tape, except for SYSVLAC1 stuff).

- 3831.** *January 14, 1987* APLNRAO1 and APLVLAC1 Z-routines *Kerry*
Routines, formerly stored in APLCVEX, which were actually specific to the NRAO Convex implementations, have been moved to APLNRAO1 (NRAO-CV Convex) and APLVLAC1 (NRAO-VLA Convex). These include special versions of the file creation routines ZCREA3, ZCREAT, ZQCRE3 and ZQCREA. Also added ZSPACE (routine used only by the NRAO Convex-specific "SPACE" facility) plus a version of ZXUID containing hard-coded NRAO *AIPS* account user ids (this routine begs for a more elegant solution).
Moved to 15JAN87 this date (APLNRAO1 stuff also made it on 15OCT86 UNIX/*AIPS* installation tape).
- 3832.** *January 14, 1987* APL1VAX and APL2VAX:ZDCHIN *Kerry*
Installers invariably fail to set the /DCHCOM/ variable BYTFLP to the proper value for VAXes, so these versions do it for them.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*AIPS* installation tape).
- 3833.** *January 14, 1987* APLCVEX:ZXMOUN and ZXTSPY *Kerry*
In the last release of their operating system, Convex fixed a problem related to tape allocation (ZXMOUN) and created a problem related to task monitoring (ZXTSPY). ZXMOUN, for Convex systems, now unloads tapes mounted without a write-ring. Formerly, on dismounts, we had to issue our own rewind/unload command, which then caused the deallocation mechanism to complain. ZXMOUN now also displays the status of the system tape drives before and after its actions. Convex changed the output format of the "ps" command, which must be parsed as the only known solution to task monitoring (i.e., SPY) in *AIPS*. This format change broke SPY on Convex systems and necessitated a Convex-specific version of ZXTSPY (i.e., instead of the generic Berkeley 4.2 version formerly used).
Moved to 15JAN87 this date.
- 3834.** *January 14, 1987* Alliant QCFFT *Kerry*
Alliant now provides a single precision version of their FX/Series Scientific Library full complex FFT routine CFFT. The single precision version (SCFFT) also allows you to toggle normalization. The default version of QCFFT now calls SCFFT and the conversion and/or de-normalization loops formerly required before and after the call to the CFFT have been removed. The double precision version of QCFFT has been saved as QCFFT.DP.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*AIPS* installation tape).
- 3835.** *January 14, 1987* SYSALLN Files *Kerry*
Minor mods to several files including ASSNLOCAL.SH, INCS.SH and LIBR.DAT. Also added a "read me" file for people doing Alliant ports.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*AIPS* installation tape).
- 3836.** *January 14, 1987* SYSSUN Files *Kerry*
Added "read me" file for people doing SUN ports as well as paraform SUN version of LIBR.DAT.
Moved to 15JAN87 this date (also made it on 15OCT86 UNIX/*AIPS* installation tape).
- 3837.** *January 15, 1987* VMS fixes *Eric*
Changed SYSVMS:AREAS.DAT to define APLNRAO1, APLVLAC1, SYSVRAO1, and SYSVLAC1. To fit the 15JAN87 system on only two 1600-bpi tapes, it was necessary to omit some stuff. Two empty libraries were deleted: AIPVMS and YVTV. This required fixing SYSVMS area files AIPPGMOPT.OPT, AIPGVMSOPT.OPT and AIPPGHOPTX.OPT which referred to the former. The INSVMS:TRANSPRT.COM file was of course also changed.
Moved to 15JAN87 before the 1600-bpi tapes were written.
- 3838.** *January 15, 1987* WHATSNOW *Eric*
Added by Editors from checkout history file: Updated the 15JAN87 information, added 15APR87, deleted 15JUL86.
Moved nowhere.

COOKBOOK Changes: 15-Jan-1987 version of *AIPS*

There were no changes made to the *COOKBOOK* this quarter, even though there probably should have been. We'll correct this with the 15APR87 release. A chapter on calibration is in preparation, but to release it now would be premature.

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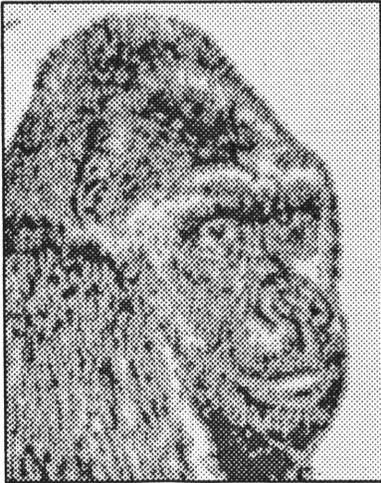
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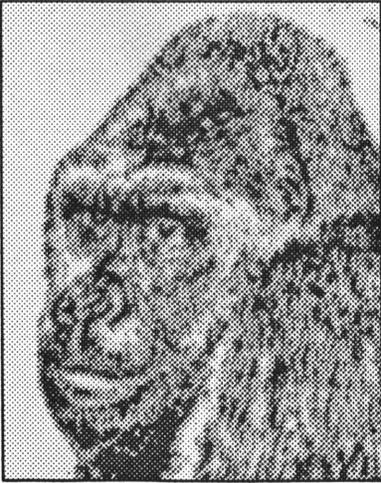
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January 15, 1987



A I P S L E T T E R

Volume VII, Number 2: April 15, 1987

National Radio Astronomy Observatory

A newsletter for users of the
Astronomical Image Processing System

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TeXset by EWG

Response Forms Attached to this *AIPSE* LETTER

There are three different response forms included at the back of this *AIPSE* LETTER. We hope that this is a unique event, but there are several matters arising for which it seems appropriate to include a reply form this quarter. They are

1. The standard *AIPS* order form — this time including the new edition of *GOING AIPS*.
2. Request for later mailings on, and suggested topics for, the next *AIPS* Workshop (15-16 Sept., see also page 5 below).
3. Request to stay on the *AIPSE* LETTER mailing list. The *AIPSE* LETTER currently goes out to over 750 addresses, and its production and mailing costs are beginning to cause NRAO some concern in a time of very tight budgets. In the last *AIPSE* LETTER we asked each of you to confirm that you need to continue receiving the *AIPSE* LETTER by returning the special form to us with confirmation of your mailing address. If your address label has an asterisk in the upper right corner, then you are recorded as having extended your *AIPSE* LETTER subscription. If it does not, you will be taken off our mailing list after this issue unless you refresh your *AIPSE* LETTER mailing address by returning the continuation form.

We Need Your Advice

Inside this *AIPSE* LETTER you will find an article on proposed changes in *AIPS* data file formats and coding standards. We suspect that all sites with implementations of *AIPS* under UNIX have versions of UNIX that are at least Berkeley 4.2 or Bell System V compatible (or some combination thereof). If so, we should no longer need to support earlier flavors such as Bell System III, Berkeley 4.1 or Amdahl's version 7 UTS. If not, sites that still need such support should let us know. Otherwise we will discontinue support for these older versions of UNIX as of the 15JUL87 release. We would appreciate your feedback on these matters either by E-mail or by regular mail (for example, when sending in any of the three response forms).

Code Overhaul

We have decided that it is time to convert the *AIPS* code to ANSI standard Fortran 77. Primarily, this will take the form of converting all `INTEGER*2` variables to `INTEGER` (i.e., 4-bytes), revising the other declaration types, changing from `ENCODE` to in-core `WRITES`, converting from type-specific to generic in-line functions (i.e., `MAXO` to `MAX`), and the like. We will write a program to do the bulk of the transformations, but there will be several areas of difficulty. Many devices and operating system functions require 16-bit integers for their input and output. Thus, the `Z` routines and, perhaps, some of the `Y` routines will have to be handled manually. Furthermore, Fortran 77 is weaker than other modern languages in its handling of character strings, in that they cannot occur with other data types in, for example, commons and I/O records. Thus, data structures such as the *AIPS* header are not allowed by the language definition. As a result, we cannot convert all hollerith strings to character strings, but must be selective and provide new functions for converting between hollerith and character.

There are several reasons for making this, perhaps overdue, change. Most important of these is the fact that 2-byte integer arithmetic has been found to be slower than 4-byte on both Vaxes and Convexes. On Vaxes, the difference seems to be about 10-30%. Most serious arithmetic in *AIPS* is done in floating point, but anything we can do to speed the code is now worth some effort. A second reason for the conversion has to do with errors in Fortran compilers. Most errors, which we have been able to diagnose, arise in the handling of 2-byte integers. With this conversion, we may be able to compile all of the code with high levels of optimization, gaining some additional performance enhancements. To date, compiler errors have prevented us from compiling non-Q subroutines with optimization. A third reason for the conversion is the limited range of 2-byte integers. Aborts for integer overflow have been a useful diagnostic in the past, but the code is now more mature and most such aborts are due to numbers which are correctly larger than 32767. Finally, many *AIPS* users wish to code in the "latest" standard language and that will also reduce the burden on the UNIX preprocessors. However, because of that language's inability to address data structures and input-output in a machine-independent fashion, the code will still contain our current handling of data structures and hollerith strings and will contain no Fortran I/O outside of `Z` routines (except internal writes and reads). We remind *AIPS* programmers that we are adopting a *limited subset* of the ANSI Fortran 77 standard, and that this does not include all of DEC's excellent enhancements, i.e., those that extend the ANSI standard and are printed in blue ink in VMS manuals.

With the exceptions of the `MA`, `UV`, and `SC` files, which are purely floating point, all other file formats will change as a result of this programming change, simply because the length of a standard integer will be doubled. We expect, also, to make some changes in file formats in order to take advantage of the additional bytes made available and to correct any poor alignments between physical and logical records. Until now, we have provided a program with each change of file format to allow users to convert their *disk* data files. We do not believe that this will be practical this time and expect, instead, to require users to move their files to `FITS` tapes (or pseudo-tape disk files) in order to move their data to the new release.

We intend to plan the conversion over the next few months and hope to begin work on it after the 15JUL87 release. Enough work may be involved that we will have to cancel the 15JAN88 release altogether. The first release using the new standards will likely be a very "major" release. Sites which have written their own *AIPS* programs may expect to have significant conversion work to do, although our source code conversion program (which we will distribute) will make the main changes.

We intend to hold back from implementing these changes until all essential parts of the calibration and editing package have been coded and tested. We also recognise that user sites that have developed significant amounts of their own code will want to change over to the new standards at a time that is convenient to them, and this may well differ from the time that is best for us. We therefore suggest that sites that want to defer making the changeover for a while, but still keep their *AIPS* installations reasonably up-to-date,

should plan on ordering our 15OCT87 release when it becomes available, as this may be the last release that abides by the present standards.

Summary of Changes: 15 January — 15 April 1987

These changes are listed in detail in the CHANGE.DOC files reproduced later in the *AIPSCLETTER*. There are 280 changes this quarter. As in the previous quarter, these changes are led by corrections and improvements to the calibration package. There are several new calibration tasks and the interface between the users and the programs has been somewhat simplified. In all areas, there are seven new tasks solely in 15JUL87 and four new ones in both 15APR87 and 15JUL87.

Changes of Interest to Users: 15APR87 as NEW

Normally, we like to avoid significant changes in the NEW area in order to allow sufficient testing of the code. However, we are releasing three new user-submitted tasks since we cannot test them very well ourselves and have made some serious changes to the user interface to the calibration package because that interface was too complicated. The new tasks are DFTPL, to plot the strength of a point source as a function of time (see entry # 4069) and LWPLA and LWPLF to display plot files on PostScript printers, particularly Apple LaserWriters (see #s 4060 and 4061). For the calibration package, a variety of new adverbs were created (# 3850) and the user interface was changed (# 3858). In particular, all massaging of the solution tables and their application to the calibration tables, was removed from the tasks LISTR, SPLIT, and CALIB and put in a new task, CLCAL, specifically designed for the purpose. A wide variety of minor bugs was also corrected.

Some other areas also received attention. WSL0D now works as advertised after a couple of bugs and a misunderstanding about the WSRT format were corrected (#s 3903, 3912, 3919). IML0D again handles history records correctly (# 3895) and the batch checker now checks the GO verb with all the same criteria as when GO is actually executed (# 3910). In the television area, support for the I²S IVAS was brought up to the current I²S releases, CURVALUE was corrected, and an infinite loop in APCLN and SDCLN on button D was short circuited (see #s 3904, 3905, 3892). The UNIX version now supports the concept of "REMOTE" users and multiple TV devices (# 4097, 4098).

Changes of Interest to Users: 15JUL87 as TST

Even more adverbs were added to the 15JUL87 release. To acquire these in your vocabulary, do either a RUN NEWPARMS or a RESTORE 0. See entry #s 4013, 4026, and 4074. These new adverbs are mostly needed for new or improved calibration tasks. These new tasks are (1) BLCAL (# 3980) to determine baseline-oriented calibrations, replacing BCAL1, (2) CLCOR (# 4027) to apply atmospheric, gain, *et al.* models to the calibration tables, and (3) POSSM (# 4013) to make a plot file of the averaged cross-power spectrum of a selected range of data. LISTR acquired more display options (# 4031). FILLR received some general improvements especially for spectral line (# 4035) and, for VLB use, VLBIN was improved significantly (#s 4041, 4049, 4057, 4075).

John Simonetti and Neil Killeen contributed the new task STFUN to compute a structure function image (# 4042, 4048). Neil also contributed new tasks BDEPO to calculate beam depolarization due to gradients in rotation measure (# 4018) and REMAG to replace magic-value blanks with a constant of the user's choosing (# 4055). Neil also improved the algorithm in POLCO (# 4050). Arnold Rots contributed the new task PRFPL to plot averaged spectra with a pen plotter and other utilities related to pen plotters (# 4007).

Other significant changes include (1) improved convolution methods used in CONVL and VM (#s 4065, 4066), (2) a new option for PRTAB (# 4074, 4077), (3) use of buffered I/O for I²S Models 70 and 75 to improve performance (# 4068), and (4) a new set of Y routines to provide partial support for ARGS TV display devices (#s 4070 and 4071).

Changes of Interest to Programmers: 15APR87 as NEW

There were no major changes of interest to programmers, except the changes to the calibration package which affect how UVGET should be used (see entry # 3858). A new service routine, RMEXT, should be of use in tasks which create or remove extension files (# 3859). Tasks which use the AP are now listed in an include file rather than in several separate areas (# 3910). Entry #s 3881 and 3886 illustrate the importance of message levels for error messages. If levels 6 or 7 are used, then the calling program can suppress the message if the error, *e.g.*, missing extension file, is "acceptable". The IVAS Y routines were brought up to I²S release 2.0 and tested on the Convex (# 3904). *GOING AIPS* was revised substantially to match the 15APR87 release and the precursor remarks for a number of Q routines were clarified as a consequence (# 4054).

Two important coding standards in *AIPS* are the avoidance of constants in calling sequences and the avoidance of mixed data types in calls to intrinsic functions. The latter should be caught by the compiler if it insists, as we will, on the strict ANSI standard. Leroy and Kerry have corrected numerous occurrences of these errors in the code; see #s 3887, 3909, 4063, and 4078.

In the system area, very little changed for VMS. There was a new Z routine for LWPLA called ZLWIO (# 4061). The compilation procedures were corrected to support the normal system defaults, rather than those on the Charlottesville VAX (# 3848); please do not use DIRTY when compiling your code. As usual, there was continued enhancement in the UNIX area. UNIX versions of the IEEE conversion Z routines were developed (# 3879). The startup procedures and programs received development to allow use of debuggers, multiple TV devices, "remote" *AIPS* usage, etc.; see #s 4090-4096. Other UNIX enhancements are described in #s 3851-3857, 3869, 3874, and 4097-4116.

Changes of Interest to Programmers: 15JUL87 as TST

There were a few changes of significance to programmers. The include DANT.INC now refers to a parameter and, thus, requires the include PUV.D.INC as well. See #s 3995 and 4008. There was a change to the format of the source extension files, a change which did not require a format conversion program (SETJY will change the format). The new format did, however, require changes to the call sequences of SOUINI and TABSOU; see # 4030.

Two new utility packages became available. For convolutions, there is a set of routines which give greatly improved performance over previous, more basic tools. See entry # 4064 for a discussion of APCONV and its subsidiary routines. Arnold Rots has provided a number of tools for use on pen plotters (# 4007).

From the Users' Group have come three contributions of interest to programmers. They are LWPLA and LWPLF to display plot files on PostScript devices and a set of routines to support ARGS TV display devices. See entries 4060, 4061, and 4071-4072 for the specific details plus some interesting discussion of coding standards.

AIPS Workshop

The next *AIPS* Workshop will be held on Tuesday, September 15 and Wednesday, September 16, at Green Bank. We are going to Green Bank this time because the meeting room, dining room, residence hall and lounge there are all on-site. This promotes the extended, informal discussions among participants that make such workshops most useful. There will be a "welcoming party" on the evening of Monday, September 14 and we hope that most attendees will be able to arrive in time for that. Those coming from far away might want to spend some extra time with the *AIPS* group in Charlottesville before or after the meeting, and we will co-ordinate transport between Charlottesville and Green Bank to facilitate this.

The format of the workshop will otherwise be similar to that of the 1985 one (reported in some detail in *AIPS* Memo No. 40). There will be a mix of formal talks, open discussion sessions on special topics, and time for informal discussions. The main purpose of these get-togethers is to promote dialog between *AIPS* users, programmers and managers and the NRAO *AIPS* group, on issues such as bringing up *AIPS* in unusual environments, managing *AIPS* at non-NRAO sites, experience (good and bad!) with *AIPS* in radio (interferometric and single-dish) and non-radio applications, needs and priorities for improvements and new developments in *AIPS*.

We welcome your suggestions for topics to cover at this meeting. We especially encourage non-NRAO *AIPS* users to give talks describing their experiences with, or viewpoints on, *AIPS* which they feel may be of interest to other *AIPS* users or programmers. We expect topics of particular interest this time to include:

- (a) discussion of the *AIPS* calibration and editing package,
- (b) suggestions for streamlining and optimizing *AIPS* code,
- (c) suggestions for exploiting large memory resources when they are available,
- (d) the broadening spectrum of *AIPS* environments: experiences with *AIPS* in "workstations" and on supercomputers,
- (e) coding difficulties and what you and we might do about them,
- (f) how to exploit computer networking for better communications within the *AIPS* community,
- (g) support from non-NRAO sites for "nonstandard" hardware,
- (h) the future evolution of *AIPS* hardware and software.

At the end of this *AIPSCLETTER* is a form on which to let us know whether you want more details about the Workshop as our plans gel, to suggest topics for discussion, and/or to volunteer a talk. Please make copies of this form for anyone at your site who may be interested, but does not receive his or her own *AIPSCLETTER*. The final announcement of the Workshop will go only to people who signify interest in it by returning one of these forms, or by sending E-mail on this topic to AIPSMAIL (full addresses on the title page).

Comparison of *AIPS* and *WERONG* UVMAP

By R. J. Sault and W. D. Cotton

A previously reported comparison of *AIPS* UVMAP (15OCT86 release) and *WERONG* UVMAP run on a Micro-VAX II at the University of Illinois by R. J. Sault indicated that the *WERONG* version ran in about 38% of the time used by the *AIPS* version. This test has been rerun on the same Micro-Vax using an improved implementation of the *AIPS* "pseudo array processor." The only changes made to *AIPS* were in the pseudo-array processor "Q" routines, which are the routines which perform most number crunching. The changes were:

- * compiling the Q routines with the VMS Fortran optimizer.
- * an improved FFT routine.
- * more efficient routines to perform block moves of data.

Editors' note: the AIPS installation procedures did not use the optimizer in the past because the results were unpredictable. However, we have found that the current Q subroutine libraries may be and should be compiled with full optimization. Our lack of use of the optimizer in the most recent releases was simply an oversight. AIPS installations using the pseudo array processor versions should consider recompiling QPSAP with option OPTIMIZE, followed by COMLNKs of QPGNOT:, QYPGM: and QYPGNOT:.

These changes resulted in a speedup of UVMAP by about a factor of two. These improvements will also give a similar improvement to many other of the heavy number crunching tasks, particularly those using FFT's.

A comparison of *AIPS* and *WERONG* UVMAP codes were performed in making a 512x512 map and beam from 53190 visibilities. Both used uniform weighting and the 6x6 prolate spheroidal gridding function. The CPU and real times were (respectively) 394 sec and 450 sec for *AIPS*, and 279 sec and 305 sec for *WERONG*. That is, *WERONG* UVMAP runs in about 71% of the *AIPS* time.

A more detailed breakdown of percent of time spend in each operation follows:

Operation	<i>AIPS</i>	<i>WERONG</i>	See Note
Data input/Binning	5%	11%	5, 6
Gridding	34%	36%	3
FFT	31%	30%	1, 2
Correction/Output	6%	5%	4, 5
System (I/O)	13%	8%	1, 7
Other	11%	10%	

Some differences to note in this comparison are:

1. *WERONG* ignores the regions of the *uv* plane without data as long as it can. For a "typical" UVMAP, this reduces the FFT time by about 25%. It also reduces scratch file i/o and transpose i/o.
2. *WERONG* has a more efficient FFT routine than the *AIPS* VMS pseudo-AP routine. This FFT routine has since been incorporated into the *AIPS* VAX pseudo AP library.
3. Though the gridding function support is 6x6, *AIPS* actually convolves using a 7x7 function to simplify some logic. This difference would contribute about 5% of program differences. Also *WERONG* does the gridding in two passes, one for the map and one for the beam, whereas *AIPS* does it in one pass (doing the two at once). The *AIPS* approach avoids the need to recalculate a number of temporaries in the gridding loop.
4. *WERONG* uses an analytic formula to calculate the gridding correction function, whereas *AIPS* uses a DFT to calculate it from the gridding convolution function (this takes about 6% of the test run of UVMAP).

5. WERONG data file format is FITS. Converting to/from FITS consumes about 10% of the WERONG UVMAP CPU time.
6. WERONG goes through a binning stage, which removes the need for sorting the input data. This consumes about 3% of the run time.
7. WERONG combines the gridding and row transform stage of the FFT to reduce the I/O.

Editors' note: The remaining differences between WERONG and AIPS cpu times can legitimately be regarded as the "AIPS overhead", i.e., the price that we pay for the sheer size and scope of the package relative to the resources available for refining it, for the AIPS bookkeeping and user interface, and for portability.

AIPS Publications

The Order Form at the end of this *AIPSLLETTER* may be used to order the following memoranda and books. All previous memoranda are also available. *GOING AIPS* is being printed in Green Bank; we expect copies of Volume 1 to become available by May 15 and of Volume 2 by June 15. If you have already ordered this new edition, please do not repeat your order.

GOING AIPS: W. D. Cotton and a cast of *AIPS*, Volumes 1 and 2, 15 April, 1987.

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, Catalogs, Disk Files, High Level Utility Routines, WaWa ("Easy") I/O, and the *AIPS* directory structure and programming tools. The second volume covers more advanced topics including tape drives, graphics displays, TV routines, plotting, array processors, tables, FITS format, Z routines, and calibration and editing routines. People are encouraged to order Volume 2 only if they feel they will actually need it. The 1987 edition has been fully updated with two new chapters on the directory structure and on calibration. Chapters on device I/O, TVs, and plotting were substantially revised. The FITS chapter contains descriptions of the new, standard and not-yet-standard tables extensions.

AIPS Memo No. 49: "The *AIPS* Wishlist," Eric W. Greisen, February 1987.

This memo represents the current version of the "things to consider doing" list maintained by the *AIPS* group. It is divided into a number of categories and some rough priorities are attached to the items listed. The present memo is an updated version of Memo No. 45 (April 1986) and shows with special symbols those items added and/or completed during that interval.

AIPS Memo No. 50: "1986 *AIPS* Site Directory," Donald C. Wells, Alan H. Bridle, Nancy D. Wiener, April 1987.

As of 30 April, 1987, 84 contact persons representing 115 machines had replied to the 1986 *AIPS* Site Survey. This memo summarizes some direct statistical information determined from these replies. All contact persons who gave us permission to do so are then listed with their names, computer and postal addresses, telephone numbers, and full details of the machines that they represent including peripheral devices, and of the fractions of the machines' time that are devoted to different classes of *AIPS* application. A cross-reference table separated by machine parameters is also given.

The 1986 *AIPS* Site Survey

Forms for the 1986 *AIPS* Site Survey were mailed to the *AIPS* Contact Persons (CPs) in January 1987. As of 30 April, the freeze-date for the survey, NRAO had received 84 responses from research (non-commercial) *AIPS* sites. 15 other CPs responded to the 1985 Survey, but not to this one, making a total of 99 CPs who have returned at least one survey form to us. We believe there are 141 CPs who are either running *AIPS* or intend soon to do so. Thus, the response rate of the 1986 survey was 60%, and was 70% for the 1985 and 1986 surveys combined.

The 1986 *AIPS* Site Directory (now available as *AIPS* Memo No. 50) lists data for the research (non-commercial) sites which returned 1986 survey forms indicating that they actually use *AIPS* and that we have permission to include them in the Directory. The full set of 141 CPs represent 175 machines, including 23 38-bit FPS array processors, one Sky Warrior AP, two pipelined-FP machines, and eight vector machines. The 84 CPs listed in the Directory only represent 115 of the 175 machines (65% completeness) but, *much* more important, they represent *all* of the high performance vector hardware of the full set. We therefore believe that the Directory is nearly complete with regard to APs and other pipelined FP hardware used with *AIPS* and, consequently, that it documents the existing *AIPS* computing power with reasonable accuracy. Another indication of completeness is network connectivity: 69 of the 141 sites have service on at least one net, and the Directory includes 62 of the 69 sites! The demography of the active *AIPS* sites, and some consequences for the planning of the *AIPS* project, will be discussed in a separate *AIPS* Memo.

The **NAME** strings reported for *AIPS* hosts have been checked and there do not appear to be any name conflicts in the community.

Growth from 1985 to 1986

- (1) The total number of machines represented in the survey is up from 87 to 175.
- (2) Installations of FPS 38-bit APs have increased from 16 to 23, and vector register, pipelined FP and non-FPS AP machines have gone from 5 to 10.
- (3) The number of DEC VAXes is up from 74 to 125, while non-DEC CPUs are up from 16 to 37 (including 2 Alliants and 2 Convexes new for 1986).
- (4) With the addition of a site in South Africa, *AIPS* now has at least one installation on each populated continent.
- (5) DEC VMS installations have increased from 69 (79% of the total) to 124 (71%), while UNIX installations (all dialects) are up from 13 (15% of the total) to 35 (20%). The VMS/UNIX ratio by number of sites has dropped from 5.3 to 3.5 in one year. (The *AIPS* power ratio is another matter: the detailed analysis in the "demographic" memo will show that there is now more *AIPS* production power under UNIX than under VMS.)
- (6) Laser printers have increased from 26 to 58 (totals now 30 QMS, 9 Apple, 7 Imagen, 7 HP, 4 DEC); Printronix printers are up from 16 to 23 and Versatecs have increased from 21 to (only) 27.
- (7) Machines with 6250 tape support are up from 37 (43%) to 86 (49%).
- (8) TV displays attached to *AIPS* CPUs have increased from 61 (70%) to 97 (55%), with IIS from 19 to 32, Gould-deAnza from 9 to 13, Sigma ARGs from 7 to 10, Grinnell constant at 7, and a variety of other possibilities being explored; note that 6 IIS IVAS displays have been installed during only the first six months of IVAS operation.

Some other important trends visible in the numbers are: (1) the rapid rise in the number of supermicro workstations, especially Micro-VAXen and Suns, (2) the substantial increase of worldwide *AIPS* power due to the installation of five high-performance vector computers, and (3) a great increase in network connectivity, to about 50% of all *AIPS* sites now.

AIPS Users' Group Column

We have received by computer mail several contributions to the *AIPS* code from our user group. Bruno Garagnon of IRAM, Grenoble, France submitted code to drive an ARGUS TV device using the output of the I²S Model 70 Y routines. He and Bruce Cogan of Mt. Stromlo Observatory, Australia both submitted versions of QHSPL adapted to drive Apple LaserWriters and, perhaps, other postscript devices. We have called these tasks LWPLF and LWPLA, respectively, and have included them in the 15APR87 release. The ARGUS routines will appear in the 15JUL87 release. Tim Bastian of the University of Colorado has submitted the task DFTPL to plot the Fourier transform of point-source visibility data as a function of time. It will plot points with or without error bars or a histogram-like format. This task also appears in the 15APR87 release. We thank Bruno, Bruce and Tim for their efforts and encourage others to do the same. It is helpful if the authors of submitted tasks could test them on relatively recent versions of *AIPS*. We have had some trouble finding and correcting old calling sequences.

Electronic Mail Issues Related to *AIPS*

NRAO has had continuous connectivity to NASA's SPAN (Space Physics Analysis Network) since mid-January; the address is 5127::5374::aipsmail and is expected to remain valid during the current quarter. Another SPAN connection is scheduled to be installed on the VAX in Charlottesville early in June. We'll tell you more about this in the next *AIPSCLETTER*.

The 1986 Site Survey shows that about 50% of the CPs of active *AIPS* sites are now reachable on at least one net available to NRAO. The *AIPS* group expects that other CPs have network service of which they are unaware or have not yet reported to us (we encourage CPs to send us test messages at the addresses given in the masthead of this *AIPSCLETTER*). Four major networks are represented in the 1986 Site Directory: BITNET/EARN, the ARPA-Internet, SPAN/HEPNET, and UUCP. More *AIPS* sites (41) are currently reachable via BITNET than on any of the other three networks, and the ARPA-Internet (22 sites) just barely got second place ahead of SPAN/HEPNET (21 sites). Many *AIPS* sites reported service on more than one of the nets; we encourage CPs to report all connectivity which they have in order to facilitate as many interchanges as possible among the worldwide *AIPS* community. With 50% connectivity having been achieved, and with the fraction visibly growing, it is clear that broadcast and "bulletin board" communications among *AIPS* CPs has now become a practical option.

Offers of code support

The following respondents to the 1986 Site Survey have offered to support *AIPS* code to the *AIPS* Users' Group and have provided these brief descriptions of what they can support. Please contact them directly for more information about their code.

=====

M. Kesteven, Radiophysics, CSIRO, P.O. Box 76, Epping, NSW 2121, AUSTRALIA

Tel. (02) 868-0321, Telex ASTRO 26230, Net: mjk@rpepping.oz

In addition to the tasks described previously (15APR86 *AIPSCLETTER*), we have a useful verb which allows us to transfer an image directly from the TV (DeAnza) to a LaserWriter. (We use the TV to set the transfer function for the grey-scale.)

=====

Dave Shone, NRAL, Jodrell Bank, Macclesfield, Cheshire SK11 9DL, ENGLAND

Tel. U.K.0477 71321, Telex 36149 JODREL G, Net: DLS%UK.AC.MAN.JB.STAR@AC.UK (Bitnet)

Several tasks have been added for transfer of images and *uv* data between *AIPS* and our local system, *OLAF*. I have modified some routines for crude image display on an *ARGS*. I have written a couple of *Z* routines to enable and disable typeahead, allowing *TEK* cursor routines to be used on users' terminals.

=====

Diego Cesarsky, Institut D'Astrophysique, 98 Bis Blvd. Arago, 75014 Paris, FRANCE

Tel. 33-1-4320 1425, Net: diego@friaps51.bitnet

I wrote a set of *Yxxx* for my *ARGS* display.

=====

Dr. Carla Fanti, Instituto di Radioastronomia, Via Irnerio 46, Bologna 40126, ITALY

Tel. 051243244, Telex 520634 INFN BO I, Net: 40062:carla

See previous site survey (15APR86 *AIPSLATTER*)

=====

Lars B. Baath, Onsala Space Obs., S-43900 Onsala, SWEDEN

Tel. Sweden 300 60650, Telex Sweden 2400

Can supply *Z*-routines for *SINTRAN III* and *ND* microcode. Full support for *AIPS* on *ND*-computer (Nord).

=====

Lee Mundy, Mail Code 105-24, California Institute of Technology, Pasadena, CA 91125

Tel. 818-356-4993, Net: phobos:lgm (on SPAN)

We have modified the *VMS DCL* to allow *AIPS* to be run under normal user accounts and forced users to own their own *AIPS* data files. The former modification allows users to be individually charged for *AIPS* cpu time and the latter modification permits disk quotas to limit abuse.

=====

Scott Allendorf, Univ. of Iowa, Dept. of Physics & Astronomy, Iowa City, IA 52242

Tel. (319) 335-1686, TWX: 910-525-1398, Net: sca%iowa.iowa@hamlet.bitnet or sca%iowa.iowa@hamlet.caltech.edu

PLTCC — Produces a plot of flux vs. clean component number. Requires linking to Caltech **P6PLOT** graphics subroutine library.

PGCON — Produces **CNTR**-like contour maps without cataloging a plot extension file. Produces hard copy or terminal display automatically, without the need to **TKPL**, **PRTPL**, or whatever. Provides less labeling options than **CNTR**, however. Requires linking to Caltech **PGPLOT** graphics subroutine library.

PRTPL — Version to drive an HP LaserJet Plus.

In the future, we will probably be able to supply a set of *Y*-routines to support the color monitor on the *VAXSTATION/GPX*. They will probably not be able to support all functions, but most should be supported. We won't know the exact capabilities until we get our hands on the hardware.

=====
Colin J. Lonsdale, Haystack Obs., NEROC, Westford, MA 01886

Tel. 617-692-4765

Task to send a plot file to the HP Laserjet Plus.

Task HRZPL to find an extension file of type PL and use the graphics commands in that file to build a bit map. The graph described by the bit map will then be written to the Hewlett-Packard Laserjet-plus printer/plotter. Adverbs USERID, INNAME, INCLASS, INSEQ, INDISK, INTYPE, INVERS, ASPMM, LPEN, and BADDISK.

We also have a Ridge-specific straightforward 150 dpi bitmap dumping task and a task which writes to the Ridge graphics terminal *very* fast.

=====
Ralph Gaume, Dept. of Astronomy, Univ. of Michigan, Ann Arbor, MI 48109-1090

Tel. 313-936-1741, Net: umast@umiphys.bitnet, umast::gaume (41.211)

Plotting routine for Imagen laser printer. Y-routines for TRAPIX TV.

=====
Frank D. Ghigo, Dept. of Astronomy, Univ. of Minnesota, 116 Church St., S.E., Minneapolis, MN 55455

Tel. 612-376-8644, Net: testlr%minn.hepnet@lbl.bitnet

We have a version of PRTPPL that works on an Apple Laserwriter, also on Printronix and HP LaserJet.

=====
Eric D. Feigelson, Dept. of Astronomy, Pennsylvania St. Univ., Univ. Park, PA 16802

Tel. 814-865-0162

Colin Lonsdale devoted much effort to an early (1983) installation including new Z (UNOS), Y (GSI graphics) and Q (Warrior) routines. No recent update has been attempted. We would be glad to distribute our Y and Q routines.

=====
Edward B. Churchwell, Washburn Obs., Univ. of Wisconsin, 475 N. Charter St., Madison, WI 53706

Grinnell Y-routines.

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TV devices

Here is a summary of the TV types other than I²S Models 70 and 75 reported as being in active use at *AIPS* sites at the time of the 1986 Site Survey. This listing is intended just to give you an idea of "what's out there" and who has it. The people whose names are listed here have not volunteered to provide community-wide assistance for this type of TV, but may be able to give you some advice based on their experiences. For full mail and network addresses, phone numbers, etc., consult the new *AIPS* Site Directory (*AIPS* Memo No. 50, order form attached to this *AIPSLATTER*).

INSTITUTION	TV Type	Contact
UC Berkeley	AED 512	Wilson Hoffman
Univ. of Sydney	AED 512	David F. Crawford
UCLA	AED 767	Mark Morris
Jodrell Bank	Apollo DN560	Dave Shone
M.I.T. Physics	Apollo DN660	John W. Dreher
Bologna	Aydin	Carla Fanti
Sandia Labs	Comtal 1/20	Jack O. Burns, Jr. (UNM)
CSIRO	Gould-DeAnza 85	M. Kesteven
E.S.O.	Gould-DeAnza 85	Gustaaf van Moorsel
NASA-GSFC Astron/Solar	Gould-DeAnza 85	Edward Sullivan
NFRA Dwingeloo	Gould-DeAnza 85	Thijs van der Hulst
NASA-GSFC Astron/Solar	Gould-DeAnza 95	Edward Sullivan
Univ. of Massachusetts	Gould-DeAnza FD5000	Susan Kleinmann
Boston Univ.	Gould-DeAnza IP8400	David Bradford
Space Telescope Sci. Inst.	Gould-DeAnza IP8500	Robert J. Hanisch
ESA/ESTEC-SA	Gould-DeAnza xxxx	Goran Pilbratt
Nobeyama Obs.	Graphica I5048	Prof. Masato Ishiguro
Penn State Univ.	Graphics Strategies	Eric D. Feigelson
CIT Astronomy PHOBOS	Grinnell GMR	Lee Mundy
Univ. of Minnesota	Grinnell GMR270	Frank D. Ghigo
Univ. of Wisconsin	Grinnell GMR270	Edward B. Churchwell
Michigan St. Univ.	Grinnell xxxx	Susan M. Simkin
Univ. of Colorado	Grinnell xxxx	Timothy Bastian
ARCFOS	IIS IVAS	Richard A. White
NRAO CEX	IIS IVAS	Eric Greisen
ST Systems Corp.	IIS IVAS	Ramesh Sinha
UC Davis	IIS IVAS	Robert H. Becker
Univ. of Calgary	IIS IVAS	Sun Kwok
Univ. of Illinois	IIS IVAS	Bob Sault
Univ. of Texas at Austin	Image Analytics Corp.	David B. Garrett
Univ. of Texas at Austin	Jupiter 7	David B. Garrett
Haystack Obs.	Lexidata	Colin J. Lonsdale
Dartmouth College	Lexidata 3400	Tim Hankins
Arecibo Obs.	Lexidata 90	Willem A. Baan
Univ. of Catania	Ramtek 9460*	Prof. Santo Catalano
Mount Stromlo Obs.	Ramtek xxxx	Bruce C. Cogan
Univ. of Michigan	RCI TRAPIX 5500	Ralph Gaume
Beijing Obs.	Sigma ARGS	Wang Shouguan
Inst. D'Astrophys. Paris	Sigma ARGS	Diego Cesarsky
Jodrell Bank	Sigma ARGS	Dave Shone
Radio. Inst. Bonn Univ.	Sigma ARGS	Peter Kalberla
Royal Greenwich Obs.	Sigma ARGS	Robert A. Laing
Starlink Edinburgh	Sigma ARGS	Dave Shone
Univ. of Grenoble	Sigma ARGS	Bruno Garagnon
Universite de Bordeaux	Sigma ARGS 7000	Juan Jose
Princeton Univ. Obs.	Sun 3 Color Monitor	Michael Rupen
Univ. of Toronto	Sun Colour Graphics	Laura Carriere
CIT Planetary Sci.	VCH-Q	Arie Grossman
Steward Obs.	Vicom	Michael Keane

The Portability Column

Image Displays

The IVAS now works on the Convex; this may imply that IVAS displays could now be supported on other systems under Unix. IIS does provide support for MassComp systems and appears to be about to support SUNs as well.

Printing and Plotting Devices

PostScript Laser Printers: The 15JAN87 *AIPSCLETTER* challenged the community to produce plotting tasks for "PostScript" printers, and two such programs were received during the quarter and will be distributed with *AIPS* installation kits. Programmers interested in an introduction to the PostScript language and a description of several plotters which support it should read an article entitled "Programming in PostScript" in the May 1987 *BYTE* magazine (pp. 185-202). A table on page 188 mentions 14 PostScript-compatible printers with 300 dpi resolution plus four others with higher resolution. An interesting candidate for European *AIPS* sites is the Agfa-Gevaert P400PS laser printer, with 400 dpi resolution (about 160 dots/cm). Programmers should also note that "NeWS" (Network/extensible Window System), recently announced by Sun Microsystems, is based on building a PostScript interpreter into each workstation window. This probably implies that the two PostScript tasks which we received could be adapted to draw directly into a Sun NeWS window, probably even supporting halftone representations of GREYS plots in the bitmap.

Product Reviews

New Vector/Concurrent Computers being Announced: Early in April, Gould (Ft. Lauderdale, FL) announced their new NP1 vector/concurrent computer systems. Announcements are expected from two other vendors, Multiflow Computer (Branford, CT) and Cydrome Inc. (Milpitas, CA), probably by the time you read this *AIPSCLETTER*. An announcement by Prime that they will market the Cydrome system is also expected in the near future. From the limited data available at this time, it appears that all three of these new systems can be loosely characterized as being in the Convex/Alliant price and performance class. The Gould system is basically a vector computer, but the Multiflow and Cydrome machines have non-vector architectures with high degrees of scalar concurrency. No information is yet available concerning the suitability of any of these machines for executing *AIPS*. We hope (and expect) to be able to discuss and compare these machines in more detail in the next *AIPSCLETTER*. Please note that our mentioning of the availability of these products does not constitute any sort of endorsement of them. Also, this review is based on our current understanding of these complex and evolving systems.

15-April-1987 Statistics

From the EXPFIT program come the following statistics for the 15OCT86 and 15JAN87 releases:

	15APR86	15OCT86	15JAN87	15APR87
Number of directories	51	74	79	79
Number of text files	2,788	3,188	3,331	3,448
Number of text lines	457,373	512,935	559,445	607,108
Number of bytes in compressed form	15,051,843	16,839,059	18,336,530	19,899,828

From the WHOGETS.ADR file come the following statistics:

Number of contact persons	147	165	174
Number of <i>AIPSCLETTER</i> recipients	720	735	759

CHANGE.DOC: 15APR87 Version as NEW

- 3839. January 16, 1987** NXTFLG *Bill*
Fixed problem with removing expired flags from the internal flag table. The old version only worked properly if the flags were sorted by end time; an entry would not be dropped until all previous entries in the table had expired. Moved from 15JUL87 this date.
- 3840. January 16, 1987** DATFLG *Bill*
DATFLG was incorrectly decoding the subarray number; flagging would only be correctly applied to subarray 1. Moved from 15JUL87 this date.
- 1. January 16, 1987** CALIB *Bill*
Fixed the number of parameters to ask for in the GTPARM call. Corrected the dimension of the array in DCLB.IHC corresponding to the AIPS abverb LEVS(XAET), from 20 to 30. These problems were causing CALIB to ignore BADDISK. Moved from 15JUL87 this date.
- 3842. January 16, 1987** APLNRAO1:/APLVLAC1:ZQCREA.C *Eric/Bill*
Changed the list of allowed file types to a list of prohibited file types for the "scratch" disk 4. Only affects the NRAO CONVEX installations. Moved from 15JUL87 this date.
- 3843. January 16, 1987** LISTR *Bill*
Fixed bug in GANSET which caused the number of antennas requested to be set to zero if any actually were. This caused a zero divide later in GAIFUV. The default IPOL in GANSET was set to 1 rather than to 3 as suggested by the message. Cleaned up handling of default EIF in LSTRIB. Fixed GAIFHX not to change the scaling factor if all entries were flagged or to make frequent small changes in the scaling. Moved from 15JUL87 this date.
- 3844. January 22, 1987** FILLR *Bill*
The maximum time allowed between time stamps in a scan was 3 times the integration time and the default integration time is 10 seconds. This was causing data with Modcomp integration times of 30 seconds to have a new scan each integration. The maximum time between time stamps is now 5 times the integration. Moved from 15JUL87 this date.
- 3845. January 24, 1987** UVFIX *Bill*
Fixed a couple of bugs writing values into history and an incorrect name for frequency in the AF table header. Moved from 15JUL87 this date.
- 3846. January 24, 1987** TABED *Bill*
Fixed a few problems with the default table for OPTYPE='KEY'. Moved from 15JUL87 this date.
- 3847. January 24, 1987** UVMAP *Bill*
Corrected call sequence to SETVIS to include the IF number. For the present, IF 1 is hard-coded in. Moved from 15JUL87 this date.
- 3848. January 24, 1987** VMS proc *Eric*
Changed SYSVMS:OPTIONS.COM — despite the VMS documentation, /WARNINGS=ALL ignores the /STANDARD specifications, but it is found that /WARNINGS=DECLARATIONS will test more than just undeclared variables, depending on the /STANDARD specification. Moved from 15JUL87 and to the VLA this date.
- 3849. January 29, 1987** TABED *Bill*
Made more robust the test to see if the input file is the output file. This is necessary because the catalog header record(s) cannot be read without getting this right. If this test gives the incorrect results, TABED will ask for an illegal combination of catalog status flags, like read and write on the same file. Moved from 15JUL87 this date.

- 3850. January 31, 1987** New Adverbs *Bill*
Added a number of new adverbs for use with the calibration tasks. The affected files are POPSDAT.HLP, D/CAPL.INC, [RUB]NEWPARMS.001, and help files for BLVER, ANTWT, SOLINT, CALCODE, REFANT, SMODEL, SOLTYPE, SOLNODE, SOLCON, WTUV, and DODELAY. The new adverbs are:
BLVER — version number of baseline correction table.
ANTWT — array of antenna weighting factors.
SOLINT — solution interval.
CALCODE — calibrator code.
REFANT — reference antenna.
SMODEL — source model.
SOLTYPE — solution type.
SOLNODE — solution mode.
SOLCON — gain constraint solution factor.
WTUV — weight for data outside of UV RANGE.
DODELAY — flag for requesting delay rate solutions.
Moved from 15JUL87 sometime.
- 3851. February 1, 1987** SYSUNIX:AREAS.*, SYSNRAO1:AREAS.CSH, *Kerry*
and SYSVLAC1:AREAS.CSH. After discovering that the CVAX source-code management system could not handle programming logicals with names in excess of 8 characters, the logicals SYSVLAC1 and APLVLAC1 were adopted in place of SYSCHOLLA and APLCHOLLA, respectively. Also, after discovering that VMS cannot handle directory structures more than 8 levels deep, the APLVLAC1 and APLNRAO1 directories had to be moved up on the same level as APLCSEX. AREAS.DAT, AREAS.CSH and AREAS.SH were modified to reflect these changes.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
- 3852. February 1, 1987** SYSNRAO1:VMS.FF *Kerry*
Line printer output from the NRAO-CV CONVEX is vectored to the CVAX Versatec line printer via "ftp" and the ethernet connection between the machines. The script SYSNRAO1:VERSATEC is designed to print an arbitrary file and appends a form feed to the end. However, the UNIX notion of a form feed and the VMS notion of a form feed differ in that VMS requires that the form feed be followed by a carriage return/line feed in order to get the desired page eject. VMS.FF serves this purpose.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
- 3853. February 1, 1987** SYSSUN:FCOPTS.SH *Kerry*
Corrected typo that claimed this file was the NRAO-CV CONVEX version rather than the SUN version.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
- 3854. February 1, 1987** APGNOT:IMFIT and JMFIT *Kerry/Bob Sault*
In the main program of IMFIT, the subroutine FCB is both called and used as an argument in a subroutine call. Under IMPLICIT NONE on the CONVEX, FCB must be both type-declared and declared EXTERNAL; otherwise the compilation fails. JMFIT has a similar situation involving the subroutine FXDVD. However, the type declaration for these routines causes other compilers to fail (e.g., SUN's "f77" as reported by Bob Sault of the U. of Illinois and reproduced on our own SUN). It was at CONVEX's suggestion that these extra declarations were made. The VMS compiler doesn't care either way, but since it causes other compilers problems, these declarations have been undone and CONVEX will simply have to come up with a better solution. NOTE: Another such program is APGNOT:UVFIT, involving the subroutines UVFUB1 and UVFUB2 as used in the routine FITMOD, but it was never "fixed" and therefore requires no change.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape). These were intentionally not COMLNN'ed to keep the midnight job from complaining.
- 3855. February 1, 1987** APGNOT:GNPLT *Kerry/Bob Sault*
In the routine GAINPL, the REAL variable PLTCOR was being used as an array index. Reddeclared PLTCOR as INTEGER*2. GNPLT still has a common block alignment problem that cannot be resolved by a simple rearrangement of the common definition. The given order is required because it is used as a data structure. The problem will ultimately be cured by the on going tables and calibration effort.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).

- 3856. February 1, 1987** **APLUNIX:ZQMSG.C** *Kerry/Bob Sault/Laura Carriere*
This routine contains code that had been branched around, pending greater attention. However, some systems (SUNs at U. Illinois and U. Toronto) still complained about `#FILE` as undeclared, whereas this is normally defined in `/usr/include/stdio.h` as the maximum number of files that can be open simultaneously (20-30 typically). In any case, since the code involved is not active, the reference to `#FILE` has been commented out.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
- 3857. February 1, 1987** **APLUNIX:ZXUID.C** *Kerry/Bob Sault/Laura Carriere*
This routine always requires some trivial local development. In particular, its function is to set the effective user id to that of the *ATPS* login and therefore requires that the installer provide a value. Some instructions should be added to the installation guide to make this requirement more clear; otherwise, this routine simply won't compile.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
- 3858. February 2, 1987** **New user interface to calibration.** *Bill*
Cleaned up the user interface to the calibration software. Principally, the `DOCAL=2` option was removed from `LISTR`, `CALIB` and `SPLIT`. Also the adverbs related to these options could be removed. Now all massaging of the `SE` tables and their application to the `CL` tables will be done by a new task `CLCAL`. This ability has been removed from `UVGET` and `GAIHIE`. Summary of changes:
`CALIB` — Removed `DOCAL=2` option, `STOKES`, and `IF` range; cleaned up some of the defaults. Added a bunch of new, specific adverbs to replace some of the `APARR`, `BPARM` ... Also `CALIB.HLP`, `D/CCLB.INC`.
`LISTR` — Removed `DOCAL=2` option; also `LISTR.HLP`, `D/CLST.INC`.
`SPLIT` — Removed `DOCAL=2` option; also `SPLIT.HLP`.
`CLCAL` — New task, concatenates, rereferences and smooths `SE` tables and optionally applies them to a `CL` table. Also `CLCAL.HLP`.
`SE2CL` — Now allows specifying a list of sources to calibrate as well as a list of calibrators; also now supports a time range.
`CLUPDA` — Modified for `CLCAL`.
`SESH0` — Now accepts a time range.
`UVGET` — Revised precursor comments describing `DOCAL=2` option.
`GAIHIE` — Removed call to `CLUPDA`.
`SEAPP` — New routine to append `SE` table and collect statistics about reference antennas used.
`CALADJ` — New routine used with `CALREF` to rereference antenna phases to a new reference antenna.
`CALREF` — New routine to change the reference antenna of the phases of the `SE` table.
Moved from 15JUL87 this date.
- 3859. February 2, 1987** **RMEXT** *Bill*
New, general routine to delete an extension file and remove it from the catalog header.
Moved from 15JUL87 this date.
- 3860. February 2, 1987** **MAKMAP** *Bill*
Correct precursor comments about calibration.
Moved from 15JUL87 this date.
- 3861. February 2, 1987** **LISTR** *Bill*
Default subarray is now 1 rather than 0. A subarray of 0 was causing the `OPTYPE='GAIH'` option not to find any valid data.
Moved from 15JUL87 this date.
- 3862. February 3, 1987** **CALIB** *Bill*
`CALIB` was using `DPARR(6)` to determine the number of frequency channels the output of a delay-rate fit for single-source data should have. `CLBAPJ` uses another criterion to determine if the frequencies are to be averaged. The default values of the parameters lead to overflowing the output file. `DPARR(6)` is now used everywhere to determine if averaging is requested; `CALIB.HLP` now contains a description of `DPARR(6)`.
Moved from 15JUL87 this date.
- 3863. February 4, 1987** **FILLR** *Bill*
`FILLR` was getting the visibility number range in the Index (`IX`) table off by 1; this was causing occasional problems in `LISTR` output if all sources were being listed. `INDXR` does not have this problem.
Moved from 15JUL87 this date.

- 3864. February 5, 1987** CLUPDA *Bill*
Cleaned up handling of **SE** tables for single-source files. CLCAL was not functioning as advertised in the help file.
Moved from 15JUL87 this date.
- 3865. February 5, 1987** CLCAL *Bill*
Added **OPCODE='SH00'** option for single-source files which will rereference and/or smooth an **SE** table. Also changed CLCAL.HLP.
Moved from 15JUL87 this date.
- 3866. February 5, 1987** LISTR *Bill*
Fixed a logic error in **GAINHX** which caused an integer overflow when delays or rates were being listed.
Moved from 15JUL87 this date.
- 3867. February 6, 1987** APGN0T:FITTP *Kerry/Bill*
Fixed at least two problems that kept this program from compiling on many systems. First, the UNIX preprocessor, in its attempt to transform an **EMCODE** statement into the equivalent internal **WRITE** plus subroutine call, would create lines that exceeded column 72 (for the subroutine call). This is because the code involved was so heavily nested that the indentation rules left very little room to spare. The UNIX preprocessor tries to preserve the indentation in order to preserve the readability of the preprocessed form. I'm not about to change, and perhaps break, the preprocessor at this date, so I violated the indentation rules in the unpreprocessed form instead. The second problem involved non-logical expressions used in a logical **IF**. This code was in the routine **FITEXT** near statement 640. The array **RECL2** was substituted for **RECI4** (they're **EQUIVALENCE'd** to each other).
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*AIPS* installation tape).
- 3868. February 6, 1987** APGN0T:WARP *Kerry*
Fixed at least two problems that kept this program from compiling on non-VMS systems. First, in the routine **FCH**, there was a common labelled **/FCH/** which has been changed to **/FCHCOM/**. Second, also in the routine **FCH**, the variable **IT**, which is part of the **/WRP/** definition, was **DATA** initialized. The problem is that other parts of **/WRP/** are **DATA** initialized in the main program, also a violation of the coding standard. **IT**, as well as other members of **/WRP/**, are now initialized via an assignment statement in the main program instead.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*AIPS* installation tape).
- 3869. February 6, 1987** APLSUN:ZXSIGC *Kerry/Tom Quinn*
SUN/3 sites with **FPA**s were having trouble running code compiled with the "**ffpa**" floating-point option and kept winding up in **ZXSIGC** (abort handler) with a floating-point exception. Tom Quinn of the U. of Toronto determined that the **FPA** code uses software signals to recalculate inaccurate results on the 68881. However, *AIPS* is designed to intercept such signals, so special code has been inserted into the **APL4PT2** version of **ZXSIGC** to create a **SUN**-specific version which will handle **FPE_FPA_ERROR** conditions differently, but still allows *AIPS* to detect "real" floating point errors.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*AIPS* installation tape).
- 3870. February 7, 1987** Programs to VMS-specific areas *Kerry*
Bugs have been dutifully reported in several programs by recipients of UNIX installation kits. The **CONVEX** support of many VMS extensions often makes detecting these bugs very difficult. Since the port of *AIPS* to the Pittsburgh Supercomputer Center has been assigned as my highest priority and since no one else seems to care enough to fix these bugs, I have moved the problem code to VMS-specific areas. I simply can't afford to deal with these problems even at the level of saying "too bad." Code moved from **AIPPGM** to **AIPGVMS**:
FIXFIL — Z format specifiers (not ANSI standard).
PRNTH — Z format specifiers (not ANSI standard).
Code moved from **APGN0T** to **APGVMS**:
VBAHT — **DATA** initialization of common variables (violation of *AIPS* coding standards, a standard for good reason).
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*AIPS* installation tape).
- 3871. February 9, 1987** CALIB *Bill*
For single-source files **CLBAPL** was replacing the correct output catalog header record with the input file header.
Moved from 15JUL87 this date.

- 3872. February 9, 1987** SYSVLAC1 Files *Kerry*
Several system-specific files for *ATPS* programming, maintenance and execution on the VLA CONVEX have been modified including:
AIPS — *ATPS* startup script
ASSLOCAL.SH — Local device assignments
SPACE — Script that generates disk hog information (it was not listing the biggest hog)
ZXLPRT — Line printer output spooling script (designed for QMS laser printer)
Moved to 15JUL87 this date.
- 3873. February 9, 1987** UNIX versions of LIBR.DAT *Kerry*
References to certain APLSUB and APLNOT routines in the Z-routines related to the tasks BAKLD and BAKTP made it necessary to insert additional passes on the object libraries for APLSUB and APLNOT code in order to resolve all external references. All UNIX versions of LIBR.DAT have been modified, including those in SYSUNIX, SYSALLN, SYSRA01, SYSVLAC1 and SYSSUB.
Moved to 15JUL87 this date.
- 3874. February 9, 1987** SYSUNIX:PPTEST and INCS.FOR *Kerry*
Embarrassingly enough, the program code suggested as a test of the UNIX preprocessor contained a variable INDEX, declared as REAL, but used as an array index. Redefined INDEX as INTEGER*2. Updated INCS.FOR to include all new INCLUDE files as of the 15JAN87 release.
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*ATPS* installation tape).
- 3875. February 9, 1987** Renamed AIPSUB:ASSIGN to ASSGN *Kerry*
The routine name ASSIGN was in direct conflict with a critical COS system verb (as in assigning files to the SSD, among other things. Calls to ASSIGN in MASSGN and QUICK have been changed to calls to ASSGN instead. This means that versions of ASSGN, MASSGN and QUICK formerly maintained in APLCOS (like quasi Z-routines) are no longer necessary and were therefore eliminated.
Moved to 15JUL87 this date.
- 3876. February 9, 1987** CLCAL *Bill*
Fixed call to RCOPY in CLCAIE which should have been to COPY.
Moved from 15JUL87 this date.
- 3877. February 9, 1987** CLUPDA *Bill*
Now the output SE is created in the sorting step rather than in SSMO since SSMO also smoothes the input table.
Moved from 15JUL87 this date.
- 3878. February 10, 1987** CALIB *Bill*
Now CLBAPL is not called if the input data had already been divided by the model. Also updated CALIB.HELP to refer to adverbs by their current names.
Moved to 15JUL87 this date.
- 3879. February 9-11, 1987** ZR32RL, ZR64RL, ZRLR32, ZRLR64 *Kerry*
The APLUNIX (i.e., generic UNIX) versions of these IEEE to local floating-point conversion (and vice versa) routines have been modified using a portable way to DATA initialize variables with "nan" values (i.e., without using hexadecimal constants). Using this technique, vendor-specific versions of all of these routines have been created in most of the UNIX vendor-specific Z-routine areas including APL1VAX, APL2VAX, APLALLN, APLCVEX, APLHASC and APLSUB. The VAX UNIX versions of ZR32RL and ZRLR32 are not as pure as I would like. They contain CHARACTER variables EQUIVALENCED to non-CHARACTER variables. This is a violation of the ANSI standard, but nevertheless works on many machines, including VAXes. The VAX UNIX versions of ZR64RL and ZRLR64 are still missing. These will require a fair amount of work to get all the bits in the right place and will probably have to be written in C (as should perhaps all of these).
Moved to 15JUL87 this date (also made it on 15JAN87 UNIX/*ATPS* installation tape).
- 3880. February 11, 1987** FILLR *Bill*
Fixed bug in handling of VLA observing program name; the last two characters were being transposed. Also added P, S, and X to the list of bands in FILLR.HELP. These were already implemented in the software, but not in the documentation.
Moved from 15JUL87 this date.

- 3881. February 11, 1987** **FLGINI** *Bill*
 Changed message level of error messages to 6 so that UVGET can suppress the messages about a non-existent flag table.
 Moved from 15JUL87 this date.
- 3882. February 11, 1987** **LISTR** *Bill*
 Corrected bug in 'LIST' option which caused listings of RR and LL not to work. Added note to VLA users in LISTR.HLP about IFs.
 Moved from 15JUL87 this date.
- 3883. February 13, 1987** **SN2CL** *Bill*
 Atmospheric and phase delays and rates were assumed to be R*8 whereas they were in fact R*4. This caused trash in several of these values and FITP to bomb on the CONVEX when trying to read these values. Also removed message about SN table being removed since it was given regardless.
 Also cleaned up several minor problems mostly involving subarrays or copying SN tables to new CL table entries.
 Moved from 15JUL87 this date.
- 3884. February 13, 1987** **CLUPDA** *Bill*
 Added message if SN table had been previously applied.
 Moved from 15JUL87 this date.
- 3885. February 13, 1987** **SNSMO** *Bill*
 Made message less specific about which SN table was being smoothed, since it is now always a temporary file.
 Moved from 15JUL87 this date.
- 3886. February 13, 1987** **CALINI** *Bill*
 Changed error message level to 7 to allow masking.
 Moved from 15JUL87 this date.
- 3887. February 16, 1987** **Mixed Data Types in Calls to Intrinsic** *Kerry*
 It is a violation of the ANSI standard to call intrinsic functions with data types of different types or length. Most compilers will let you get away with this, but some won't, in particular, IBM compilers and until recently, Alliant compilers (pre version 3.0.4). Unfortunately, *ATPS* is riddled with such calls and NRAO has no in-house machine that will detect these for us. The violations have been fixed in the following code, however, it is inevitable that new cases will creep back in. The code listed below covers all machine-independent subroutine libraries and a few programs. The remaining programs containing such violations will simply have to wait for another day. Routines changed:
- | | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|
| in AIPSUB | AU1A | AU3A | AU5C | AU6B | BBUILD | PREAD |
| | SGLOCA | TVROAM | | | | |
| in APLSUB | CHCOMP | CHCOPY | CHFILL | CHXPB1 | CHXPB2 | CHXPBD |
| | FILZCH | GINIT | HIADD | KPACK | MAPFIX | HDESTR |
| | MINI3 | PASEBC | SKYFRM | TABIO | TRIM | UVDISK |
| | WHOAMI | | | | | |
| in APLNOT | HIREAD | TBLIO | | | | |
| in YSUB | IAXIS1 | IMANOT | IMCHAR | INPCLR | TVFIDL | |
| in APLPGM | PRTAC | | | | | |
| in YPGM | TKPL | | | | | |
- Moved to 15JUL87 this date.
- 3888. February 16, 1987** **VLBDR** *Eric*
 Removed this obsolete task.
 Removed from 15JUL87 as well.
- 3889. February 17, 1987** **RMEXT** *Bill*
 Corrected a error determining the number of tables of a given type.
 Moved from 15JUL87 this date.
- 3890. February 19, 1987** **CALADJ** *Bill*
 Removed commented out CALIB includes.
 Moved from 15JUL87 this date.

3891. February 19, 1987 CALIB Bill
Fixed several bugs in CLBSRC (the fringe-fitting routine) which caused a bad reference antenna solution not to be blanked. Also removed subroutine CLBREF and replaced it with a call to CALREF.
Moved from 15JUL87 this date.
3892. February 19, 1987 APCLN, SDCLN Eric/Bill
Fixed bug reputed to cause an infinite restore loop when the TV was used and Button D was pushed.
Moved from 15JUL87 this date and SDCLN on 26-Feb.
3893. February 20, 1987 VISDFT Bill
Fixed logic which caused problems when using the NONEG option (take only to the first negative component). If the total number of components made the routine think that two passes were necessary, but one was sufficient, the routine was returning with an error condition.
Also changed to allow use of the secondary "AP" memory on vector machines.
Moved from 15JUL87 this date.
3894. February 20, 1987 UVMDIV Bill
Changed to allow use of the secondary "AP" memory on vector machines.
Moved to 15APR87 this date.
3895. February 20, 1987 IMLOD Eric
IMLOD was calling HIAD80 with the character pointer moving through a large buffer. This is no good, since HIAD80 is oriented to 80-character cards. Added a CHCOPY and changed the pointer. Also added a HICLOS for IBM format, since a later routine is going to issue a HIOPEB.
Moved from 15JUL87 this date, nowhere else.
3896. February 21, 1987 CALIB Bill
Fixed bug in CLBDIV which caused the wrong source flux density to be used from the SU table if only a single calibrator was specified.
Moved from 15JUL87 this date.
3897. February 28, 1987 CALIB Bill
Fixed a number of problems involving phase-amplitude calibration with a large number of frequency channels. First, the number of channels the program thinks that it has to swallow is now set to the actual number to be used rather than the total number in the input data. Second, averaging of frequencies in an IF is now done in GASOLV as the data is accumulated rather than later. This allows using smaller accumulation arrays than would otherwise be required.
Moved from 15JUL87 this date.
3898. March 2, 1987 UVDISK Bill
Patched a section of code so that it would not blow up using I*2 variables. The logic was okay, but the I*2 integers were not. (An intermediate result was blowing the limit.)
Moved from 15JUL87 this date.
3899. March 5, 1987 VBCIT John
Changed the declaration of variables IFR and IFL to I*2, instead of I*4. Also added the include file PUV.D.IBC.
Moved to 15APR87 and 15JUL87.
3900. March 7, 1987 SN2CL Bill
Now calls SHIHI with opcode READ; this was causing problems in CLCAL.
Moved from 15JUL87 this date.
3901. March 10, 1987 AIPGVMS:EXPFIT Kerry
Moved file names with the extension .DAT from the reject list to the accept list. Otherwise, rather critical files such as AREAS.DAT and LIBR.DAT get left off the tape.
Moved to 15JUL87 this date.
3902. March 11, 1987 FITTP.HLP Eric
Added from CHECKOUT history: Corrected antique description of available FORMATS.
Moved from 15JUL87 this date.

3903. March 13, 1987 WSL0D Eric
The include file DWIE.IEC had a bad declaration which could be the cause of our troubles with the task.
Moved from 15JUL87 this date.

3904. March 17, 1987 IVAS on UNIX Eric
The IVAS has been brought up under UNIX on the CONVEX. Our hardware was updated by I²S to version 2.0 and the Y routines required a few changes for this. A new Z routine for UNIX was developed. Most of the trouble stemmed from the use of the I²S software system in our Y routines. This system is available from I²S in object form for VMS and some UNIX machines, but not the CONVEX. We finally obtained under license the needed software and adapted the small portion of it required by the IVAS. Unfortunately, we cannot ship the resulting C code without permission of I²S. The changes we will ship are:
ZIVSOP — (UNIX) Opens IVAS, using ZXTRLOG to get device name.
YCRCTL — Used to call FIVASHOUSEPOSITION which is no longer supported. Changed to call FIVASHOUSESTATUS, which is available for both version 1.1 and 2.0. Changed call to YBUTON. Added error handling (and ignoring — HouseStatus returns the Y position as an error code in the absence of a real error).
YBUTON — Changed call sequence to receive the first button value read by YCRCTL. Changed to use FIVASHOUSESTATUS rather than the now defunct FIVASHOUSEBUTTON.
YINIT — Added initializing channel 3 in the 8-bit (3-channel) mode. Added zeroing of the character memory for completeness.
YCHRW — Changed to write a two-character string (2nd null) for each character and dropped the length argument from call to FIVASGFTEXT (their documentation strikes again).
Moved from CONVEX to 15JUL87 and 15APR87 this date, nowhere else.

3905. March 19, 1987 CURVALUE Eric
Corrected AU6B — the scaling for logarithmic transfers read from the TV memory was wrong. Also changed it to reduce the "file not found" messages to a reasonable minimum; it was issuing one at each new pixel. Corrected YCOVER (YGEN) — it was reading the wrong records from the image catalog and was testing only the bottom left and top right corners for overlap. Also changed it to produce a more general output. It now tests for overlap within each quadrant rather than just for any overlap within the image planes that are on in the quadrant.
Moved from CONVEX to 15JUL87 and 15APR87 this date.

3906. March 19, 1987 WHATSNEW Eric
Updated for new changes to 15APR87 and 15JUL87. Dropped section for 15OCT86.
Moved nowhere, the 15JUL87 one has to be done separately.

3907. March 20, 1987 FILLR Bill
Fixed bugs in MCWAET which caused data over a day boundary to be integrated forever.
Moved from 15JUL87 this date.

3908. March 21, 1987 BLSUM Eric
Corrected setting of channels to zero the scroll. Graphics are now called channel #GRAY+1, not 16.
Moved from 15JUL87 this date.

3909. March 24-26, 1987 Integer Constants in Calls Leroy/Kerry
Integer constants and expressions involving integer constants were found in some calls to subroutines and functions. These have been replaced with initialized INTEGER*2 variables with names of the form #n. Calls to intrinsic functions containing integer constants were also fixed up to avoid mixed data types (a violation of the ANSI standard).
Routines changed:
in APGEOT ANCAL BSHAP HGEON IENDX UVMOD VLBIE
in APGVMS PRING VBANT VBCC
in QPGEOT VBFIT
in YIVAS YTVCLS
in AIPPGM BATER CATCHG CATCHR FILAI2 GRIPR
in AIPGVMS DICOHV DIRECT EXPFIT
Moved from 15JUL87 this date.

3910. *March 30, 1987* AIPSC, AP tasks *Eric*
Brought AIPSC, subroutine CU2, up to date with AU2. Several improvements, such as checking system limits on disk and tape numbers and using a larger number of records for each TS file entry had not been made. Created two include files, DAPT and VAPT, to list all AP-using tasks. Put these in AIPSC and QFPS16:QIBIT. Changed AIPSC to do no delay of submitted jobs; previously it delayed at least 30 seconds. Changed QHGR to do less delay initially in waiting for a job.
Moved from 15JUL87 this date, nowhere else.
3911. *March 30, 1987* GOING AIPS *Eric*
Added from CHKOUT history: Moved CHAPn .RHO and .HEH files for n 2 through 16, plus APPENDIXA, GOINHAIPS, and some of the index and table of contents files for the final 15APR87 release of GOING AIPS.
Moved from 15JUL87 this date.
3912. *April 1, 1987* WSLOD *Thijs/Eric*
I changed the routine IETCHK to verify whether baselines are existing WSRT baselines to get rid of the fake stuff on tape I was not aware of (and WSLOD was therefore not aware of). DOALL = 1, to include non-standard WSRT baselines, should now work. Also changed ZCLOSE to ZTPCLS for the tape.
Moved fixes only from 15JUL87, nowhere else.
3913. *April 1, 1987* Imagen *Brian Glendenning/Eric*
Changed IMGPL, correcting call sequence to SETLOC and cleaning up the typing. Changed PRIMG the same way. The latter required adjustable array dimensions to be plain INTEGER, the other variables being INTEGER*2.
Moved from 15JUL87, nowhere else.
3914. *April 2, 1987* LaserWriters *Eric*
Bruno Garagnon of IRAM, Grenoble, France has submitted a task for LaserWriter printer/plotters which we have called LWPLF. A competing LWPL, which we have called LWPLA, has also been received from Bruce Cogan at Mt. Stromlo Observatory. See the entries for 15JUL87 for detailed remarks from the authors. Files affected: LWPLA.HLP, APGVHS:LWPLA.FOR, LWPLA.HLP, APLVHS:ZLWIO.FOR and APGHOT:LWPLA.FOR.
Moved from 15JUL87 as well.
3915. *April 2, 1987* MAXFIT *Eric*
Changed the limit on PIXY from 1.0 to 0.0. Users are confused when IPUTS MAXFIT complains, even though the code works fine for zeros on all one-point axes. It won't work well if users enter zeros for the real axes. Added clarification about error handling to ISBATCH help file.
Moved from 15JUL87 this date, nowhere else.
3916. *April 4, 1987* IVAS *Bob Sault/Eric*
The characters produced when YCHRW wrote in the graphics planes were almost illegible. Bob discovered that, if they were written in "replace" rather than "OR" mode, they would be rather good. Made this change and changed AU6B (CURVALUE) to rewrite the black background after each position update. Otherwise, the background image began to show through. Also changed AU5 to put in a time delay after GRCLEAR and INCLEAR commands. The IVAS was not completing the graphics clear when it was immediately reopened to do something else (as in the procedure TVALL).
Moved from 15JUL87 this date.
3917. *April 6, 1987* LWPLF *Garagnon/Eric*
An additional entry point to do rows of grey pixels was submitted. This entry is not used yet, but was submitted in the hope of a recoding of the grey pixel section of the main plotting routine (which now does one pixel at a time for some reason).
Moved from 15JUL87 as well.
3918. *April 6, 1987* DFTPL *Tim Bastian/Kerry/Eric*
Tim Bastian of the University of Colorado has submitted the task DFTPL with help file and includes now called DDFT.IHC and CDFT.IHC. See the entry for 15JUL87 for details.
Moved from 15JUL87 this date.
3919. *April 8, 1987* WSLOD *Eric*
One more addressing bug was corrected: the improvement of the typing/coding fell for one of the traps built in to the previous style of coding.
Moved from 15JUL87 this date.

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3920. April 15, 1987 APLUNIX:ZTRLOG Kerry
This is a routine designed to eventually replace the old UNIX "logical" translating routine ZXTLOG (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3921. April 15, 1987 UNIX AIPS, BATER startup procedures Kerry
Changed the AIPS and BATER start up procedures in SYSUNIX (generic) as well as the custom versions in SYSRA01 (C'ville CONVEX) and SYVLAC1 (VLA CONVEX) to simplify running under the control of a debugger, running a "local" version of AIPS (or BATER) and to accommodate multi-TV-device environments (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3922. April 15, 1987 AIPGUNIX:ZSTRTA and ZSTRTB Kerry
Changed to simplify starting up local versions of AIPS and BATER (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3923. April 15, 1987 APLUNIX:ZACTV8 Kerry
Updated to stay in step with the VMS version (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3924. April 15, 1987 APLUNIX:ZACTV9 Kerry
Changed the calling sequence such that the length of character arguments are explicitly passed. Also changed the logic for debug mode execution (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3925. April 15, 1987 APLUNIX:ZWHOMI Kerry
Updated to stay in step with the VMS version, only one step further by going ahead with the planned elimination of the "primary" and "secondary" business in regard to TV and Tektronix device access priorities (they were only social statements anyway). Prior to these changes, AIPS REMOTE would not work for UNIX implementations.
Moved to 15JUL87 same date.
3926. April 15, 1987 UNIX versions of LIBR.DAT Kerry
This crucial programming file has undergone a format change (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3927. April 15, 1987 SYSUNIX:COMLNK and LINK Kerry
COMLNK was changed so that it returned same error as returned by LINK. Also changed to accommodate the new format of LIBR.DAT (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3928. April 15, 1987 SYSUNIX:COMRPL, AS, CC and FC Kerry
Cured the same problem that COMLNK had with processing error returns from subordinate procedures. Also changed to stage multiple copies of object modules for replacement in multiple object libraries (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3929. April 15, 1987 SYSUNIX:LIBR Kerry
Changed to take an optional "logfile" argument. Formerly, object library update messages were not being recorded in the execution log files of COMLNK and/or LINK.
Moved to 15JUL87 same date.
3930. April 15, 1987 SYSUNIX:SEARCH, LIBS and MAKEAT Kerry
With the new LIBR.DAT format, SEARCH, LIBS and MAKEAT must necessarily behave differently (see change in 15JUL87 for details).
Moved to SEARCH and LIBS 15JUL87 same date. Required change for MAKEAT was discovered after 15APR87 was frozen on CVAX, but it did make it onto the UNIX installation tape for 15APR87.

3931. April 15, 1987 SYSUNIX:PRINTENV Kerry
It turns out that "printenv" is Berkeley UNIX specific. However, it was used by many of the AIPS programming scripts to make the use of environment variables more like the use of VMS logicals (when will I learn not to give in to the VMS freaks). To save myself from this one, I've written a version of "printenv" that should work for all UNIX systems.
Moved to 15JUL87 same date.
3932. April 15, 1987 Kludges for SYSNRAO1 and SYSVLAC1 Kerry
Created CONVEX-specific versions of FC to handle a Fortran compiler bug and to examine a list of modules to be compiled with a different optimization level from the default (see 15JUL87 for details).
Moved to 15JUL87 same date.
3933. April 15, 1987 APLUNIX:ZDIR Kerry
Updated to be similar to the newest VMS version (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3934. April 15, 1987 APLUNIX:ZDCHIN, ZABORT and ZABOR2 Kerry
ZABORT is a new routine that is used to establish abort handling. It's intended to replace ZESTEX and is only called by ZDCHIE. ZABORT defines ZABOR2 as its abort handler (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3935. April 15, 1987 APLUNIX:ZTFILL Kerry
Eliminated VMS event flag preservation (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3936. April 15, 1987 APLCVEX:ZSTAIP and ZSTAI2 Kerry
Implemented a scheme for reminding users of tapes that are still allocated on exit from AIPS (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3937. April 15, 1987 APLUNIX:ZERROR and ZERRO2 Kerry
These routines are intended to replace ZQMSG (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3938. April 15, 1987 SYSNRAO1:ASSNLOCAL.SH Kerry
Added the definition for the IVAS TV device as TVDEV2 as well as the Tektronix device associated with the AIPS2 station as TKDEV2.
Moved to 15JUL87 same date.
3939. April 15, 1987 APLUNIX:ZMSGWR Kerry
A new routine to facilitate message writing from non-Fortran Z-routines (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3940. April 15, 1987 APLUNIX:ZLWIO Kerry
A new, untested routine required by the new task LWPLA which is the counterpart of QKSPL for LaserWriters (see change in 15JUL87 for details).
Moved to 15JUL87 same date.
3941. April 15, 1987 UNIX ZESTEX and ZXSIGC Kerry
These routines have been replaced by ZABORT and ZABOR2 and have been deleted from all UNIX Z-routine directories including APLUNIX, APLBELL, APLBERK and APLALLN in the case of ZESTEX and APLUNIX, APLUTS, APLCVEX, APL4PT2 and APLSUB in the case of ZXSIGC.
Removed from 15JUL87 same date.
3942. April 15, 1987 File deletions from APLALLN Kerry
Removed routines that no longer need to be Alliant specific (see change in 15JUL87 for details).
Removed from 15JUL87 same date.
3943. April 15, 1987 APLUNIX:ZCRDIR and ZTAPIO Kerry
Changed the integer argument declarations for these routines from "short int" to "long int" since this is what is passed by INPFIT (the only program that calls them).
Moved to 15JUL87 same date.

3944. April 15, 1987 APGUNIX:IMPFIT Kerry
Changed the declarations in the commented out examples of UNIX Z-routines to tell the truth.
Moved to 15JUL87 same date.

CHANGE.DOC: 15JUL87 Version as TST

3945. January 16, 1987 NXTFLG Bill
Fixed problem with removing expired flags from the internal flag table. The old version only worked properly if the flags were sorted by end time; an entry would not be dropped until all previous entries in the table had expired.
Moved to 15APR87 this date.

3946. January 16, 1987 DATFLG Bill
DATFLG was incorrectly decoding the subarray number; flagging would only be correctly applied to subarray 1.
Moved to 15APR87 this date.

3947. January 16, 1987 CALIB Bill
Fixed the number of parameters to ask for in the GTPARM call. Corrected the dimension of the array in DCLB.IBC corresponding to the ATPS abverb LEVS(XANT), from 20 to 30. These problems were causing CALIB to ignore BADDISK.
Moved to 15APR87 this date.

3948. January 16, 1987 APLNRAO1:/APLVLAC1:ZQCREA.C Eric/Bill
Changed the list of allowed file types to a list of prohibited file types for the "scratch" disk 4. Only affects the NRAO CONVEX installations.
Moved to 15APR87 this date.

3949. January 18, 1987 LISTR Bill
Fixed bug in GAHSET which caused the number of antennas requested to be set to zero if any actually were. This caused a zero divide later in GAINUV. The default IPOL in GAHSET was set to 1 rather than to 3 as suggested by the message.
Cleaned up handling of default EIF in LSTRIN.
Fixed GAINMX not to change the scaling factor if all entries were flagged or to make frequent small changes in the scaling.
Moved to 15APR87 this date

3950. January 22, 1987 FILLR Bill
The maximum time allowed between time stamps in a scan was 3 times the integration time and the default integration time is 10 seconds. This was causing data with Modcomp integration times of 30 seconds to have a new scan each integration. The maximum time between time stamps is now 5 times the integration
Moved to 15APR87 this date.

3951. January 24, 1987 UVFIX Bill
Fixed a couple of bugs writing values into history and an incorrect name for frequency in the AN table header.
Moved to 15APR87 this date.

3952. January 24, 1987 TABED Bill
Fixed a few problems with the default table for OPTYPE='KEY'.
Moved to 15APR87 this date.

3953. January 24, 1987 UVMAP Bill
Corrected call sequence to SETVIS to include the IF number. For the present, IF 1 is hard coded in.
Moved to 15APR87 this date.

3954. January 24, 1987 VMS proc Eric
Changed SYSVMS:OPTIONS.COM — despite the VMS documentation, /WARNINGS=ALL ignores the /STANDARD specifications, but it is found that /WARNINGS=DECLARATIONS will test more than just undeclared variables, dependings on the /STANDARD specification.
Moved from 15JUL87 and to the VLA this date.

3955. January 29, 1987 TABED Bill
Made more robust the test to see if the input file is the output file. This is necessary because the catalog header record(s) cannot be read without getting this right. If this test gives the incorrect results, TABED will ask for an illegal combination of catalog status flags, like read and write on the same file.
Moved to 15APR87 this date.
3956. January 31, 1987 New Adverbs Bill
Added a number of new adverbs for use with the calibration tasks. The affected files are POPSDAT.HLP, D/CAPL.INC, [RUB]NEWPARMS.001, and help files for BLVER, ABTWT, SOLINT, CALCODE, REFANT, SHODEL, SOLTYPE, SOLMODE, SOLCON, WTUV, and DODELAY. The new adverbs are:
BLVER — version number of baseline correction table.
ABTWT — array of antenna weighting factors.
SOLINT — solution interval.
CALCODE — calibrator code.
REFANT — reference antenna.
SHODEL — source model.
SOLTYPE — solution type.
SOLMODE — solution mode.
SOLCON — gain constraint solution factor.
WTUV — weight for data outside of UVRANGE.
DODELAY — flag for requesting delay rate solutions.
Moved to 15APR87 sometime.
3957. February 1, 1987 SYSUNIX:AREAS.*, SYSNRAO1:AREAS.CSH Kerry
and SYSVLAC1:AREAS.CSH. After discovering that the CVAX source code management system could not handle programming logicals with names in excess of 8 characters, the logicals SYSVLAC1 and APLVLAC1 were adopted in place of SYSCHOLLA and APLCHOLLA, respectively. Also, after discovering that VMS cannot handle directory structures more than 8 levels deep, the APLVLAC1 and APLNRAO1 directories had to be moved up on the same level as APLCVEX. AREAS.DAT, AREAS.CSH and AREAS.SH were modified to reflect these changes.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3958. February 1, 1987 SYSNRAO1:VMS.FF Kerry
Line printer output from the NRAO-CV CONVEX is vectored to the CVAX Versatec line printer via "ftp" and the ethernet connection between the machines. The script SYSNRAO1:VERSATEC is designed to print an arbitrary file and appends a form feed to the end. However, the UNIX notion of a form feed and the VMS notion of a form feed differ in that VMS requires that the form feed be followed by a carriage return/line feed in order to get the desired page eject. VMS.FF serves this purpose.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3959. February 1, 1987 SYSSUN:FCOPTS.SH Kerry
Corrected typo that claimed this file was the NRAO-CV CONVEX version rather than the SUN version.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3960. February 1, 1987 APGNOT:IMFIT and JMFIT Kerry/Bob Sault
In the main program of IMFIT, the subroutine FCB is both called and used as an argument in a subroutine call. Under IMPLICIT NONE on the CONVEX, FCB must be both type declared and declared EXTERNAL, otherwise the compilation fails. JMFIT has a similar situation involving the subroutine FIDVD. However, the type declaration for these routines causes other compilers to fail (e.g., SUN's "f77" as reported by Bob Sault of the U. of Illinois and reproduced on our own SUN). It was at CONVEX's suggestion that these extra declarations were made. The VMS compiler doesn't care either way, but since it causes other compilers problems, these declarations have been undone and CONVEX will simply have to come up with a better solution. NOTE: another such program is APGNOT:UVFIT involving the subroutines UVFU01 and UVFU02 as used in the routine FITHOD, but it was never "fixed" and therefore requires no change.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape). These were intentionally not CORRECT'ed to keep the midnight job from complaining.

3961. February 1, 1987 APGNOT:GNPLT Kerry/Bob Sault
In the routine GAINPL, the REAL variable PLTCOR was being used as an array index. Redeclared PLTCOR as INTEGER*2. GNPLT still has a common block alignment problem that cannot be resolved by a simple rearrangement of the common definition. The given order is required because it is used as a data structure. The problem will ultimately be cured by the on going tables and calibration effort.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3962. February 1, 1987 APLUNIX:ZQMSG.C Kerry/Bob Sault/Laura Carriere
This routine contains code that had been branched around, pending greater attention. However, some systems (SUNs at U. Illinois and U. Toronto) still complained about NFILE as undeclared, whereas this is normally defined in /usr/include/stdio.h as the maximum number of files that can be open simultaneously (20-30 typically). In any case, since the code involved is not active, the reference to NFILE has been commented out.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3963. February 1, 1987 APLUNIX:ZXUID.C Kerry/Bob Sault/Laura Carriere
This routine always requires some trivial local development. In particular, its function is to set the effective user id to that of the ATPS login and therefore requires that the installer provide a value. Some instructions should be added to the installation guide to make this requirement more clear, otherwise, this routine simply won't compile.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/ATPS installation tape).
3964. February 2, 1987 New user interface to calibration. Bill
Cleaned up the user interface to the calibration software. Principally the DOCAL=2 option was removed from LISTR, CALIB and SPLIT. Also the adverbs related to these options could be removed. Now all massaging of the SE tables and their application to the CL tables will be done by a new task CLCAL. This ability has been removed from UVGET and GAINH. Summary of changes:
CALIB — Removed DOCAL=2 option, STOKES, and IF range; cleaned up some of the defaults. Added a bunch of new, specific adverbs to replace some of the APARM, BPARM ... Also CALIB.HLP, D/CCLB. INC.
LISTR — Removed DOCAL=2 option; also LISTR.HLP, D/CLST. INC.
SPLIT — Removed DOCAL=2 option; also SPLIT.HLP.
CLCAL — New task, concatenates, rereferences and smooths SE tables and optionally applies them to a CL table. Also CLCAL.HLP.
SN2CL — Now allows specifying a list of sources to calibrate as well as a list of calibrators; also now supports a time range.
CLUPDA — Modified for CLCAL.
SESHO — Now accepts a time range.
UVGET — Revised precursor comments describing DOCAL=2 option.
GAINH — Removed call to CLUPDA.
SEAPP — New routine to append SE table and collect statistics about reference antennas used.
CALADJ — New routine used with CALREF to rereference antenna phases to a new reference antenna.
CALREF — New routine to change the reference antenna of the phases of the SE table.
Moved to 15APR87 this date.
3965. February 2, 1987 RMEXT Bill
New, general routine to delete an extension file and remove it from the catalog header.
Moved to 15APR87 this date.
3966. February 2, 1987 MAKMAP Bill
Correct precursor comments about calibration.
Moved to 15APR87 this date.
3967. February 2, 1987 LISTR Bill
Default subarray is now 1 rather than 0. A subarray of 0 was causing the OPTYPE='GAIN' option not to find any valid data.
Moved to 15APR87 this date.
3968. February 3, 1987 CALIB Bill
CALIB was using DPARM(6) to determine the number of frequency channels the output of a delay-rate fit for single-source data should have. CLBAPJ uses another criteria to determine if the frequencies are to be averaged. The default values of the parameters lead to overflowing the output file. DPARM(6) is now used everywhere to determine if averaging is requested; CALIB.HLP now contains a description of DPARM(6).
Moved to 15APR87 this date.

3969. February 4, 1987 FILLR Bill
FILLR was getting the visibility number range in the Index (IX) table off by 1; this was causing occasional problems in LISTR output if all sources were being listed. INDXR does not have this problem.
Moved to 15APR87 this date.
3970. February 5, 1987 CLUPDA Bill
Cleaned up handling of SN tables for single-source files. CLCAL was not functioning as advertised in the help file.
Moved to 15APR87 this date.
3971. February 5, 1987 CLCAL Bill
Added OPCODE='SHOO' option for single-source files which will rereference and/or smooth an SN table. Also changed CLCAL.HLP.
Moved to 15APR87 this date.
3972. February 5, 1987 LISTR Bill
Fixed a logic error in GAINHX which caused an integer overflow when delays or rates were being listed.
Moved to 15APR87 this date.
3973. February 6, 1987 APGNOT:FITTP Kerry/Bill
Fixed at least two problems that kept this program from compiling on many systems. First, the UNIX preprocessor, in its attempt to transform an ENCODE statement into the equivalent internal WRITE plus subroutine call, would create lines that exceeded column 72 (for the subroutine call). This is because the code involved was so heavily nested that the indentation rules left very little room to spare. The UNIX preprocessor tries to preserve the indentation in order to preserve the readability of the preprocessed form. I'm not about to change, and perhaps break, the preprocessor at this date, so I violated the indentation rules in the unpreprocessed form instead. The second problem involved non-logical expressions used in a logical IF. This code was in the routine FITEXT near statement 640. The array RECL2 was substituted for RECI4 (they're EQUIVALENCE'd to each other).
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/AIPS installation tape).
3974. February 6, 1987 APGNOT:WARP Kerry
Fixed at least two problems that kept this program from compiling on non-VMS systems. First, in the routine FCB, there was a common labelled /FCB/ which has been changed to /FCBCOH/. Second, also in the routine FCB, the variable IT, which is part of the /WRP/ definition, was DATA initialized. The problem is that other parts of /WRP/ are DATA initialized in the main program, itself a violation of the coding standard. IT, as well as other members of /WRP/, are now initialized via an assignment statement in the main program instead.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/AIPS installation tape).
3975. February 6, 1987 APLSUN:ZXSIGC Kerry/Tom Quinn
SUN/3 sites with FPAs were having trouble running code compiled with the "ffpa" floating-point option and kept winding up in ZXSIGC (abort handler) with a floating-point exception. Tom Quinn of the U. of Toronto determined that the FPA code uses software signals to recalculate inaccurate results on the 68881. However, AIPS is designed to intercept such signals, so special code has been inserted into the APL4PT2 version of ZXSIGC to create a SUN-specific version which will handle FPE_FPA_ERROR conditions differently, but still allows AIPS to detect "real" floating point errors.
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/AIPS installation tape).
3976. February 7, 1987 Programs to VMS-specific areas Kerry
Bugs have been dutifully reported in several programs by recipients of UNIX installation kits. The CONVEX support of many VMS extensions often makes detecting these bugs very difficult. Since the port of AIPS to the Pittsburgh Supercomputer Center has been assigned as my highest priority and since no one else seems to care enough to fix these bugs, I have moved the problem code to VMS-specific areas. I simply can't afford to deal with these problems even at the level of saying "too bad." Code moved from AIPPGH to AIPGVMS:
FIXFIL — Z format specifiers (not ANSI standard).
PRETHE — Z format specifiers (not ANSI standard).
Code moved from APGNOT to AIPGVMS:
VBAST — DATA initialization of common variables (violation of AIPS coding standards, a standard for good reason).
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/AIPS installation tape).

3977. February 9, 1987 SYSVLAC1 Files Kerry

Several system-specific files for *AIPS* programming, maintenance and execution on the VLA CONVEX have been modified including:

- AIPS — *AIPS* startup script
- ASSELOCAL.SH — Local device assignments
- SPACE — Script that generates disk hog information (it was not listing the biggest hog)
- ZXLPRT — Line printer output spooling script (designed for QMS laser printer)

Moved to 15APR87 this date.

3978. February 9, 1987 UNIX versions of LIBR.DAT Kerry

References to certain APLSUB and APLNOT routines in the Z-routines related to the tasks BAKLD and BAKTP made it necessary to insert additional passes on the object libraries for APLSUB and APLNOT code in order to resolve all external references. All UNIX versions of LIBR.DAT have been modified, including those in SYSUBIX, SYSALLB, SYSERA01, SYSVLAC1 and SYSSUE.

Moved to 15APR87 this date.

3979. February 9, 1987 SYSUNIX:PPTEST and INCS.FOR Kerry

Embarrassingly enough, the program code suggested as a test of the UNIX preprocessor contained a variable INDEX, declared as REAL, but used as an array index. Redeclared INDEX as INTEGER*2. Updated INCS.FOR to include all new INCLUDE files as of the 15JAN87 release.

Moved to 15APR87 this date (also made it on 15JAN87 UNIX/*AIPS* installation tape).

3980. February 9, 1987 Baseline calibration Bill

Implemented the correlator (baseline-based) calibration routines. These are to replace the functionality of BCAL1 and BCAL2. BCAL1 is replaced by BLCAL, which can also do the model division. The function of BCAL2 is incorporated in the "standard" calibration routines and is accessible from LISTR and SPLIT. BLCAL computes the corrections and places them in a baseline correction (BL) table. For both single- and multi-source files, SPLIT is used to apply the baseline (BL) table. For the particularly perverse, BLCAL can be used to do the time-dependent antenna gain calibration, although it will not do cross polarizations. The changes are described below:

- D/CSEL.INC — Added variables to the calibration common needed for baseline calibration. Changed the dimension of BLFAC to more efficient use of memory. This change requires recompiling most of the calibration software.
- BLCAL — New task to determine baseline dependent calibration factors. This task is a reworked version of BCAL1. Also D/CBLC.INC and BLCAL.HLP.
- BLINI — New routines to process Baseline (BL) dependent calibration tables.
- TABBL — New routines to process Baseline (BL) dependent calibration tables.
- CLUPDA — Revised memory usage for smoothing SE tables due to the changed dimension of BLFAC.
- UVGET — Changed to set LUN to use for BL table, to tell the LUN assignments in the precursor comments, and to close BL table, if necessary. Now calls GAINIE no matter what. UVGET no longer marks the input file "WRIT".
- GAINIE — Changed to initialize BL table I/O, check that tables big enough.
- BLGET — New routine to read the BL table and interpolate to the current time. It is used for baseline calibration.
- BLSET — New routine to read the BL table and interpolate to the current time. It is used for baseline calibration.
- CGASET — Now uses BLSET to initialize the baseline factor array BLFAC and include the contents of the BL table if requested.
- DATGET — Now calls DATCAL if DOBL is true to apply baseline calibration whether or not antenna calibration is done.
- DATCAL — Can now apply either or both antenna and baseline calibration.
- LISTR — Added adverb BLVER to indicate which BL table (if any) to apply. Also enabled use of OP-TYPE='MATX' for single-source data. Also changed: D/CLST.INC and LISTR.HLP.
- CALIB — Internally initialized the baseline table version number to a value which will cause CALIB not to attempt to apply a BL table.
- SPLIT — Added adverb BLVER to specify which BL table (if any) to apply. Also SPLIT.HLP.

Moved nowhere.

3981. February 9, 1987 QFPS16:QINIT.FOR Bill

Added BLCAL to the list of AP tasks.

Moved nowhere.

3982. February 9, 1987 CALIB Bill
For single-source files, CLBAPL was replacing the correct output catalog header record with the input file header.
Moved to 15APR87 this date.
3983. February 9, 1987 CLCAL Bill
Fixed call to RCOPY in CLCAIE which should have been to COPY.
Moved to 15APR87 this date.
3984. February 9, 1987 CLUPDA Bill
Now the output SE is created in the sorting step rather than in SSMO, since SSMO also smoothes the input table.
Moved to 15APR87 this date.
3985. February 9, 1987 Renamed AIPSUB:ASSIGN to ASSGN Kerry
The routine name ASSIG# was in direct conflict with a critical COS system verb (as in assigning files to the SSD, among other things). Calls to ASSIG# in MASSG# and QUICK have been changed to calls to ASSG# instead. This means that versions of ASSG#, MASSG# and QUICK formerly maintained in APLCOS (like quasi Z-routines) are no longer necessary and were therefore eliminated.
Moved to 15APR87 this date.
3986. February 10, 1987 CALIB Bill
Modified not to create an output file or call CLBAPL if the input data had already been divided by a model. The SE table is appended to the input file in any case. Also cleaned up the handling of history when the model division had already been done. Also updated the EXPLAIN portion of the CALIB.HELP file to use the new adverb names.
Partially moved to 15APR87 this date.
3987. February 9-11, 1987 ZR32RL, ZR64RL, ZRLR32, ZRLR64 Kerry
The APLUNIX (i.e., generic UNIX) versions of these IEEE to local floating-point conversion (and vice versa) routines have been modified using a portable way to DATA initialize variables with "nan" values (i.e., without using hexadecimal constants). Using this technique, vendor-specific versions of all of these routines have been created in most of the UNIX vendor-specific Z-routine areas including APL1VAX, APL2VAX, APLALL#, APLCVEX, APLMASC and APLSUE. The VAX UNIX versions of ZR32RL and ZRLR32 are not as pure as I would like. They contain CHARACTER variables EQUIVALENCED to non-CHARACTER variables. This is a violation of the ANSI standard, but nevertheless works on many machines, including VAXes. The VAX UNIX versions of ZR64RL and ZRLR64 are still missing. These will require a fair amount of work to get all the bits in the right place, and will probably have to be written in C (as should perhaps all of these).
Moved to 15APR87 this date (also made it on 15JAN87 UNIX/AIPS installation tape).
3988. February 11, 1987 FILLR Bill
Fixed bug in handling of VLA observing program name; the last two characters were being transposed. Also changed help file.
Moved to 15APR87 this date.
3989. February 11, 1987 FLGINI Bill
Changed message level of error messages to 6 so that UVGET can suppress the messages about a non-existent flag table.
Moved to 15APR87 this date.
3990. February 11, 1987 LISTR Bill
Corrected bug in 'LIST' option which caused listings of RR and LL not to work. Added note to VLA users in LISTR.HELP about IFs.
Moved to 15APR87 this date.
3991. February 13, 1987 SN2CL Bill
Atmospheric and phase delays and rates were assumed to be R*8 whereas they were in fact R*4. This caused trash in several of these values and FITP to bomb on the CONVEX when trying to read these values. Also removed message about SE table being removed since it was given regardless.
Also cleaned up several minor problems mostly involving subarrays or copying SE tables to new CL table entries.
Moved to 15APR87 this date.

3992. February 13, 1987 CLUPDA Bill
 Added message if SE table had been previously applied.
 Moved to 15APR87 this date.
3993. February 13, 1987 SNSMO Bill
 Made message less specific about which SE table was being smoothed, since it is now always a temporary file.
 Moved to 15APR87 this date.
3994. February 13, 1987 CALINI Bill
 Changed error message level to 7 to allow masking.
 Moved to 15APR87 this date.
3995. February 16, 1987 DANT.INC Bill
 Changed dimension of POLCA, POLCB to (2*MAXIF) to allow saving feed ellipticity and orientation.
 Moved nowhere.
3996. February 16, 1987 Mixed Data Types in Calls to Intrinsic Kerry
 It is a violation of the ANSI standard to call intrinsic functions with data types of different types or length. Most compilers will let you get away with this but some won't, in particular, IBM compilers and until recently, Alliant compilers (pre version 3.0.4). Unfortunately, *ATPS* is riddled with such calls and NRAO has no in-house machine that will detect these for us. The violations have been fixed in the following code, however, it is inevitable that new cases will creep back in. The code listed below covers all machine-independent subroutine libraries and a few programs. The remaining programs containing such violations will simply have to wait for another day. Routines changed:
- | | | | | | | |
|-----------|--------|--------|--------|--------|--------|--------|
| in AIPSUB | AU1A | AU3A | AU5C | AU6B | BBUILD | PREAD |
| | SGLOCA | TVROAM | | | | |
| in APLSUB | CHCOHP | CHCOPY | CHFILL | CHXPB1 | CHXPB2 | CHXPB3 |
| | FILZCH | GINIT | HIADD | KPACK | MAPPFX | MDESTR |
| | HIBI3 | PASEBC | SKYFRM | TABIO | TRIM | UVDISK |
| | WHOAMI | | | | | |
| in APLHOT | HIREAD | TBLIO | | | | |
| in YSUB | IAXIS1 | IMANOT | INCHAR | IMPCLR | TVFIDL | |
| in APLPGM | PRTAC | | | | | |
| in YPGH | TKPL | | | | | |
- Moved to 15APR87 this date.
3997. February 16, 1987 VLBDR Eric
 Removed this obsolete task.
 Moved to 15APR87 as well.
3998. February 17, 1987 RMEXT Bill
 Corrected an error determining the number of tables of a given type.
 Moved to 15APR87 this date.
3999. February 19, 1987 CALADJ Bill
 Removed commented out CALIB includes.
 Moved to 15APR87 this date.
4000. February 19, 1987 CALIB Bill
 Fixed several bugs in CLBSRC (the fringe-fitting routine) which caused a bad reference antenna solution not to be blanked. Also removed subroutine CLBREF and replaced it with a call to CALREF.
 Moved to 15APR87 this date.
4001. February 19, 1987 SOUFIL Bill
 Made search for sources and calibrators in the source table more efficient when few sources are passed by AIPS.
 Moved nowhere.
4002. February 19, 1987 SDCLN, APCLN Eric/Bill
 Fixed bug reputed to cause an infinite restore loop when the TV was used and Button D was pushed.
 Moved to 15APR87 this date.

4003. February 20, 1987 DESCN Bill
Now only creates file the size needed for the output file. Also now only reads the portion of the input file needed to copy to the output file. This task is used to select a subsection of a uv file for test purposes.
Moved nowhere.
4004. February 20, 1987 BAKLD, BAKTP Don
Changed in APLUNIX, ZBKTP1 and ZBKLD1 to call ZTPCLS rather than ZCLOSE. Fixed bug in ZBKLD2 in which BAKLD would not load certain catalog slots correctly. Turned off "verbose" output option in ZBKTP2. Turned off a "verbose" output of ZBKLD2 in 'PRET' option case. These changes were originally installed on cholla at the VLA on 26 January. Also changed handling of ZTPCLS calls in BAKLD and BAKTP.
Moved nowhere (the midnight job has already done it).
4005. February 20, 1987 VISDFT Bill
Fixed logic which caused problems when using the `NOSEG` option (take only to the first negative component). If the total number of components made the routine think that two passes were necessary, but one was sufficient, the routine was returning with an error condition.
Also changed to allow use of the secondary "AP" memory on vector machines.
Moved to 15APR87 this date.
4006. February 20, 1987 UVMDIV Bill
Changed to allow use of the secondary "AP" memory on vector machines.
Moved to 15APR87 this date.
4007. February 20, 1987 KONTR, PRFPL, COMPLIT, OUTPLT Arnold
Changed KONTR and its help and include (`PCHTREQ`, `CATDAT`, `CATREC`, and `COVS`) files to conform better with standards; made it suitable for CONVEX (needed one change to the code).
Introduced PRFPL which plots average spectra on a pen plotter, and uses COMPLIT, a general-purpose graph-plotting package. All these plotting tasks/routines use standard Calcomp calls and should also function on the CONVEX.
Introduced OUTPLT, a utility for unspooling plot files for a Zeta plotter, just as a courtesy to Zeta plotter owners.
Introduced STARPOS.HLP, PRFPL.HLP and ZETA.HLP.
Moved to APGN0T:.
4008. February 20, 1987 Numerous Bill
A recent change made to `IEC:DAFT.IEC` requires a `PARAMETER` in `IEC:PUVD.IEC`. The following routines had `PUVD.IEC` included
- | | | | | | | |
|------------|--------|--------|-------|-------|-------|-------|
| in APGN0T: | AVER | FILLR | FITTP | GAPLT | PRTDR | PRTGA |
| | UVAVG | UVERR | UVFIL | UVFIX | VBCAL | VBHRG |
| | VBPLT | | | | | |
| in APLPGH: | PRTAE | UVCOP | UVEXP | | | |
| in APLSUB: | ABTDAT | ANTINI | TABAN | | | |
| in AIPPGH: | UPDAT | | | | | |
| in APGVHS: | TOVLB | VBAHT | WSLOD | | | |
- Moved nowhere.
4009. February 20, 1987 IMLOD Eric
IMLOD was calling HIAD80 with the character pointer moving through a large buffer. This is no good, since HIAD80 is oriented to 80-character cards. Added a `CECOPY` and changed the pointer. Also added a `HICLOS` for IBM format, since a later routine is going to issue a `HIOPEH`.
Moved to 15APR87 this date, nowhere else.
4010. February 21, 1987 CALIB Bill
Fixed bug in CLBDIV which caused the wrong source flux density to be used from the SU table if only a single calibrator was specified.
Moved to 15APR87 this date.
4011. February 23, 1987 BLCAL Bill
There was an error which would cause an incorrect flux density to be obtained from the SU table if only a single source was specified or only a single source was in the multi-source file.
Moved nowhere.

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4012. February 25, 1987 POLCO Neil
I had been cavalier in my use of include files; removed some that were unnecessary. Modified history section to be more tolerant when there is no input file history so that the POLCO parameters are still written to the new history. Minor typing changes throughout also.
Moved nowhere.
4013. February 26, 1987 POSSM Phil
New task: produces a plot extension containing either a scalar or vector averaged cross-power spectrum of a selected range of data. Does a very similar job to PASSUM on the Dec-10. Also created POSSM.HLP. Changed DAPL and CAPL includes and POPS DAT.HLP to introduce the new adverb LSRVEL.
Moved nowhere.
4014. February 27, 1987 GOING AIPS Bill
Returning the updated *GOING AIPS*. Volume 1 (chapters 1-8 and Appendix A) are as have been sent to Green Bank to be printed. Volume 2 is in an unsettled state. Files: GOINGAIPS.RNO, CHAP2.RNO, CHAP3.RNO, CHAP4.RNO, CHAP5.RNO, CHAP6.RNO, CHAP7.RNO, CHAP8.RNO, APPENDIXA.RNO, CHAP9.RNO, CHAP10.RNO, CHAP11.RNO, CHAP12.RNO, CHAP13.RNO, CHAP14.RNO, CHAP15.RNO, CHAP16.RNO.
Moved nowhere.
4015. February 27, 1987 TABCOP Bill
TABCOP now requires that the output file not physically exist rather than the older test that there be no files of that extension type with a higher version number.
Moved nowhere.
4016. February 27, 1987 SETJY Phil
Modified SETJY so that as well as setting the ZEROSP fluxes in the SU table, it now sets the LSRVEL of the source. Also help file.
Moved nowhere.
4017. February 28, 1987 CALIB Bill
Fixed a number of problems involving phase-amplitude calibration with a large number of frequency channels. First, the number of channels the program thinks that it has to swallow is now set to the actual number to be used rather than the total number in the input data. Second, averaging of frequencies in an IF is now done in GASOLV as the data is accumulated rather than later. This allows using smaller accumulation arrays than would otherwise be required.
Moved to 15APR87 this date.
4018. February 28, 1987 BDEPO Neil
New task: BDEPO tries to calculate beam depolarization because of rotation measure gradients. Use NHER to make the gradient image and IHVIN to plot the beam depolarization ratio image against the observed depolarization ratio image. Also help and explain file.
Moved nowhere.
4019. March 2, 1987 UVDISK Bill
Patched a section of code so that it would not blow up using I*2 variables. The logic was okay, the I*2 integers were not. (An intermediate result was blowing the limit.)
Moved to 15APR87 this date.
4020. March 5, 1987 VBCIT John
Changed the declaration of variables IFR and IFL to I*2, instead of I*4. Also added the include file PUV.D.INC.
Moved to 15APR87 and 15JUL87.
4021. March 7, 1987 SN2CL Bill
Now calls SHINI with opcode READ; this was causing problems in GLCAL.
Moved to 15APR87 this date.
4022. March 7, 1987 POSSM Phil/Bill
Fixed bugs in (1) selection by antenna, (2) normalization of the amplitudes and (3) labeling the phase plot. Added the baseline if only 2 antennas were given.
Moved nowhere.

4023. March 10, 1987 BDEPO Neil
I had been a bad lad and made some comparisons between REAL*4 variables and character constants. Replaced these with comparison to REAL*4 variables initialized with Hollerith data. Changed a couple of INCLUDE statements in subroutine CATUP so that FILTAB was properly declared with enough space. Changed all statement labels to begin in column 2. Made HELP file slightly more readable.
Moved nowhere.
4024. March 10, 1987 AIPGVMS:EXPFIT Kerry
Moved file names with the extension .DAT from the reject list to the accept list. Otherwise, rather critical files such as AREAS.DAT and LIBR.DAT get left off the tape.
Moved to 15APR87 this date.
4025. March 11, 1987 FITTP.HLP Eric
Added from CHKOUT history: Corrected antique description of available FORMATS.
Moved to 15APR87 this date.
4026. March 12, 1987 New adverbs Bill
Added adverbs:
VELDEF — Definition of velocity system (radio or optical).
VELTYP — Velocity type (e.g., LSR, Heliocentric).
Added/changed: VELDEF.HLP, VELTYP.HLP, POPSDAT.HLP, DAPL.INC, CAPL.INC, NEWPARMS.001.
Moved nowhere.
4027. March 13, 1987 CLCOR Bill
New task. Determines and applies corrections to CL tables. Contains various atmospheric, gain, etc. models; i.e., is the equivalent of the VLA GTBCOR. Also CLCOR.HLP, D/CCLC.INC.
Moved nowhere.
4028. March 13, 1987 GETANT Bill
New routine. Reads AN table and leaves the results in a common contained in D/CANS.INC.
Moved nowhere.
4029. March 13, 1987 GETSOU Bill
New routine. Reads SU table and leaves the results for a specified source ID in a common contained in D/CSOU.INC.
Moved nowhere.
4030. March 13, 1987 Source (SU) table format change Bill
Added the keywords VELTYP and VELDEF to the header to keep the velocity type (e.g., 'LSR') and definition (e.g., 'RADIO'). Made the frequency offset a function of IF, and added a column RESTFREQ to keep the rest frequency of the line in each IF. SOUINI and TABSOU are tolerant of the old format and return zero or blank as appropriate for the missing values. SETJY will convert the formats (see below). SOUINI writes messages about not finding SU tables at level 6 to allow masking — this should take care of the unwanted DBCON messages (the spelling of initialized is also corrected).
These changes resulted in changed call sequences for SOUINI and TABSOU. Routines/files modified for the new call sequences:
AFCAL DBCON VLBIH DVLB.INC CALIB BLCAL
FSDSOU SOUFIL SOURSU
Other changes are described below.
Moved nowhere.
4031. March 13, 1987 LISTR Bill
Upgraded for new SU table format. Now uses GETSOU except for OPTY='SCAF' option. Added STOKES='POL', 'POLC' to OPTY='MATX' option to list RL and LR, or RL and Conj(LR), respectively. Also help file.
Moved nowhere.
4032. March 13, 1987 SETJY Bill
Upgraded for new SU format. If the old format is encountered, it will be converted to the new format. Now also writes velocity definition and type and line rest frequencies to the SU file. Also SETJY.HLP.
Moved nowhere.

4033. March 13, 1987 SPLIT Bill
Upgraded for new SU format. Now corrects output CH table for source peculiar frequency offsets and copies rest frequency, velocity info, etc. to the output header for multi-source files.
Moved nowhere.
4034. March 13, 1987 TABKEY Bill
Changed the message level for missing keywords to 6 to allow masking them out.
Moved nowhere.
4035. March 13, 1987 FILLR Bill
Fixed a number of bugs accumulating and normalizing line format data. Also removed parallactic angle correction option. Made major revision in the way the number of line channels and the channel separation were determined. The history file now tells if Hanning smoothing or normalization by the autocorrelation spectrum has been done. Added a value to DPARM to allow specifying the number of channels in the desired data for cases in which there is ambiguity.
Did a general cleanup and an attempt to remove the machine dependencies; the older version would only work on machines with 16-bit integers and 32-bit reals.
Now, more of the source-specific information is copied to the SU table. The antenna tables now contain default values for circularly polarized feeds.
Also changed FILLR.HLP, D/CFLR.IEC, D/CHC.IEC.
Moved nowhere.
4036. March 13, 1987 WSLOD Eric
The include file DWIIE.IEC had a bad declaration which could be the cause of our troubles with the task.
Moved to 15APR87 this date.
4037. March 16, 1987 DGHEAD Bill
Fixed call sequence to SOUINI; added VELTYP, VELDEF.
Moved nowhere.
4038. March 17, 1987 CONVL Bill
Modified to normalize convolving function images by the number of pixels in the convolving. This leads to correctly scaled values. Previously, images produced by convolving two images needed to be multiplied by the number of pixels in the convolving image to get the correct scaling. Also removed discussion of integer and real images from CONVL.HLP.
Moved nowhere.
4039. March 17, 1987 IVAS on UNIX Eric
The IVAS has been brought up under UNIX on the CONVEX. Our hardware was updated by I²S to version 2.0 and the Y routines required a few changes for this. A new Z routine for UNIX was developed. Most of the trouble stemmed from the use of the I²S software system in our Y routines. This system is available from I²S in object form for VMS and some UNIX machines, but not the CONVEX. We finally obtained under license the needed software and adapted the small portion of it required by the IVAS. Unfortunately, we cannot ship the resulting C code without permission of I²S. The changes we will ship are:
ZIVSOP — (UNIX) Opens IVAS, using ZXRLOG to get device name.
YCRCTL — Used to call FIVASHOUSEPOSITION which is no longer supported. Changed to call FIVASHOUSESTATUS, which is available for both version 1.1 and 2.0. Changed call to YBUTTON. Added error handling (and ignoring — HouseStatus returns the Y position as an error code in the absence of a real error).
YBUTTON — Changed call sequence to receive the first button value read by YCRCTL. Changed to use FIVASHOUSESTATUS rather than the now defunct FIVASHOUSEBUTTON.
YIHIT — Added initializing channel 3 in the 8-bit (3-channel) mode. Added zeroing of the character memory for completeness.
YCHRW — Changed to write a two-character string (2nd null) for each character and dropped the length argument from call to FIVASGFTEXT (their documentation strikes again).
Moved from CONVEX to 15JUL87 and 15APR87 this date, nowhere else.
4040. March 18, 1987 SOUFIL Bill
Corrected dimension of SUKOLS, SUBUHV. SU was getting clobbered.
Moved nowhere.

4041. March 18, 1987 VLBIN Phil
Several changes:
(1) Fixed call to TABSOU which was failing since the call sequence was updated.
(2) Changed SETPRM so would recognise if data being read in was line or continuum.
(3) Modified so that if untransformed line data is read in it will be transformed by an FFT not a DFT.
(4) Fixed routines PROCESS and FBSCOR so that they will now do the FBS correction on more than a 12 freq. channel database. Also PROCESS assumed all data had a bandwidth of 2 MHz when it came to calculating the processor delay error, this did not matter previously because the FBS correction was switched off when database had > 12 channels.
(5) Updated help file and includes DSET and CSET.
Moved nowhere.
4042. March 18, 1987 STFUN Neil/John Simonetti
STFUN is a new task that will calculate a structure function image. I have optimized (vectorized) STFUN on the CONVEX C-1 at level 02. It also runs successfully on the VAX 11/780 with the /OPTIMIZE switch turned on. It is important to install this task with these optimizing options turned on because the number of operations that it does goes roughly as N^4 where N is the image width. The standard ATPS installation procedures use level 00 on the C-1 and /#00PT on the 11/780. A speed gain of 50 was obtained on the C-1 between levels 00 and 02. A gain of 2 was obtained on the 11/780 between /#00PT and /OPT. 00 on the C-1 was roughly equal in speed to /OPT on the 11/780. The main work routine could probably be written with Q routines so that a VAX with an AP would do better, but it's not an entirely trivial exercise. Any volunteers? Also HELP and EXPLAIN files.
Moved nowhere.
4043. March 19, 1987 CURVALUE Eric
Corrected AUGB — the scaling for logarithmic transfers read from the TV memory was wrong. Also changed it to reduce the "file not found" messages to a reasonable minimum; it was issuing one at each new pixel. Corrected YCOVER (YGEN) — it was reading the wrong records from the image catalog and was testing only the bottom left and top right corners for overlap. Also changed it to produce a more general output. It now tests for overlap within each quadrant rather than just for any overlap within the image planes that are on in the quadrant.
Moved from CONVEX to 15JUL87 and 15APR87 this date.
4044. March 19, 1987 WHATSNEW Eric
Updated for new changes to 15APR87 and 15JUL87. Dropped section for 15OCT86.
Moved nowhere, the 15APR87 one has to be done separately.
4045. March 20, 1987 FILLR Bill
Fixed bugs in FLRSOU which gave bad source coordinates and frequency offsets and bugs in HCHWANT which caused data over a day boundary to integrate forever.
Partially moved to 15APR87 this date.
4046. March 21, 1987 BLSUM Eric
Corrected setting of channels to zero the scroll. Graphics are now called channel #GRAY+1, not 16.
Moved to 15APR87 this date.
4047. March 24, 1987 QPSAP:QGRIDA, QFINGR Bill
Expanded these "VFC" Q routines, used by UVMAP, into inline code. This will speed up these routines.
Moved nowhere.
4048. March 24, 1987 STFUN.HLP Neil/John Simonetti
Included some discussion about errors in the output structure function. Generating an error image is a horrendous job and is left as an exercise for the student.
Moved nowhere.
4049. March 25, 1987 VLBIN Phil
The FBS correction was failing because in several places the width of a delay channel was hard-wired in, changed to depend on the bandwidth used.
Fixed so machine delay correction now done for line data. Modified to now pass auto-correlation data, depending on the input data type (DECODE 3 or 5) the data is FFT'd or not. Autocorrelation data can be identified since the antenna numbers will be the same; $u,v,w = 0$; and the imaginary part of the complex visibility is set to zero. The Van-Vleck clipping correction can now be done (is a user option) but is only necessary for strong maser lines. Also updated help file and includes DSET and CSET.
Moved nowhere.

4050. *March 25, 1987* POLCO Neil
Modified maximum likelihood estimator subroutine yet again. The brute force correction from the asymptotic solution to the m.l. solution previously used a series of straight line segments. Now it uses a third-order polynomial which is slightly more accurate at low signal-to-noise. Also modified (il-)logic in correction section to ensure header doesn't think there are magic blanks when there aren't. This could happen in certain unlikely circumstances. Minor changes to HELP file.
Moved nowhere.
4051. *March 24-26, 1987* Integer Constants in Calls Leroy/Kerry
Integer constants and expressions involving integer constants were found in some calls to subroutines and functions. These have been replaced with initialized INTEGER*2 variables with names of the form *IN*. Calls to intrinsic functions containing integer constants were also fixed up to avoid mixed data types (a violation of the ANSI standard). Routines changed:
in APGEOT AFCAL BSHAP HGEOM INDXR UVMOD VLBIN
in APGVHS PRING VBANT VBCC
in QPGEOT VBFIT
in YIVAS YTVCLS
in AIPPGH BATER CATCHG CATCHR FILAI2 GRIPR
in AIPGVHS DICONV DIRECT EXPFIT
Moved to 15APR87 this date.
4052. *March 26, 1987* VAX Pseudo-AP improvements Bill
Added a new, scalar FFT routine, FFT842, to QVHS; with the utility routines R8TX, R4TX, R2TX and a version of QCFFT to call them. This FFT is about 35% faster than the QPSAP:QXFOUR on a VAX. (QXFOUR does a reasonable job on vector machines).
Added calls to LIB\$HOVC3 in QVHOV, QGET and QPUT for moving large blocks of data.
Moved nowhere.
4053. *March 30, 1987* AIPSC, AP tasks Eric
Brought AIPSC, subroutine CU2, up to date with AU2. Several improvements, such as checking system limits on disk and tape numbers and using a larger number of records for each TS file entry had not been made.
Created two include files, DAPT and VAPT, to list all AP-using tasks. Put these in AIPSC and QFPS16:QIINIT. Changed AIPSC to do no delay of submitted jobs; previously it delayed at least 30 seconds. Changed QHGR to do less delay initially in waiting for a job.
Moved to 15APR87 this date, nowhere else.
4054. *March 30, 1987* GOING AIPS, QPSAP Eric
Replaced the "final" versions of the GOING AIPS chapters including the *.MEM files, the index files, and the table of contents files. Some chapters were rewritten, others moderately edited, and some just had a few typos corrected. In doing this, I found that some of the Q routines had misleading precursor comments. Corrected were QPSAP: versions of QCRVHU, QCVCHU, QCVCDE, QCVEXP, QCVJAD, QCVHNA, QCVNUL, QCVSHS, QDIRAD, QPHSRO, QPOLAR, and QRECT.
Moved the GOING AIPS material to 15APR87 as well.
4055. *March 31, 1987* REMAG Neil
REHAG is a new task that simply REplaces MAGic blanks in an image window by a user-specified value. For example, this may be useful for converting blanks to zeros in order to take a Fourier Transform. Also added the new help file.
Moved nowhere.
4056. *March 31, 1987* CALIB Phil
Put in a trap to prevent unnatural death when attempting to run CALIB on data with a small baseline times channel combination. Also fixed format statement which was causing an output conversion error for narrow band line data.
Moved nowhere.
4057. *March 31, 1987* VLBIN Phil
Modified so that velocity information is now automatically written to the SU table and more entries into the history file. Also changed the help file some.
Moved nowhere.

4058. April 1, 1987 WSLOD Thijs/Eric
I changed the routine IBTCHK to verify whether baselines are existing WSRT baselines to get rid of the fake stuff on tape I was not aware of (and WSLOD was therefore not aware of). DOALL = 1, to include non-standard WSRT baselines, should now work. Also changed ZCLOSE to ZTPCLS for the tape.
Moved fixes only to 15APR87, nowhere else.
4059. April 1, 1987 Imagen Brian Glendenning/Eric
Changed IMGPL, correcting call sequence to SETLOC and cleaning up the typing. Changed PRIMG the same way. The latter required adjustable array dimensions to be plain INTEGER, the other variables being INTEGER*2.
Moved to 15APR87, nowhere else.
4060. April 2, 1987 LWPLF Eric
Bruno Garagnon of IRAM, Grenoble, France has submitted a task for LaserWriter printer/plotters which we have called LWPLF. He writes:
"I modified the QHSPL task for our Apple LaserWriter, translating the graphic commands of the CSTR and GREYS tasks into a "PostScript" program. My new LWPL task does not fit to the ATPS I/O standard: I use the simple single Fortran statements OPEE and WRITE instead of the collection ZPHFIL, ZOPEE, ZQIO, ... with the FTABs, LUHs, ... which seems to me pretty complicated. (Why don't you use the Operating System handling of I/O through standard Fortran ?)
The grey-scale commands (opcode 7) following the vector ones (opcode 5), the tick marks (and other contours ?) are overwritten by the grey 'pixels'. I didn't want to go into the GREYS task, to change the order, and I don't like to make LWPL undo what GREYS did. I modified also the QMSVEC routine because the very first command (for the start point) generated was '0 1 moveto' instead of 'BLCx BLCy moveto'.
Editors' reply: "We use ZPHFIL, ZOPEE, ZFIO (or ZMIO) to do I/O to many devices. By calling them Z routines, we can put any host dependencies that are required into them. There is nothing to stop a particular implementation from simply using Fortran I/O if that will, on the particular host, do what is expected of the Z routine. We initially had hoped to use standard Fortran I/O in ATPS, but after months of frustration, gave up. The details of implementation between different operating systems simply vary too much. For LWPL, I would have created a Z routine ZLWIO, analogous to our ZQHSIO. We use that to manage different forms of (Fortran) opens (VMS always requires non-ANSI 77 constructs), buffered/blocked I/O (also Fortran), and closes with various dispositions. With a UNIX and a VMS version of ZQHSIO — and they differ in small but critical ways — we have QHSPL running not only on VAXes, but on all UNIX implementations of ATPS. The new site survey will show that there is now as much computer power running ATPS under UNIX as there is under VMS!"
Files affected: LWPLF.HLP and APGVMS:LWPLF.FOR.
Moved to 15APR87 as well.
4061. April 2, 1987 LWPLA Eric
A competing LWPL has also been received from Bruce Cogan at Mt. Stromlo Observatory. He writes:
"The task LWPL is modeled on QHSPL. It is designed to send ATPS plot files to a PostScript printer. It has been tested only with the combination of a VAX 780 running VMS and an Apple LaserWriter. It handles all types of plot file records. The output parameter system, DPARM, has been simplified from the QHSPL one. LWPL always uses the default halftone pattern of the printer. The scaling parameters DPARM(1)–DPARM(4) have been retained as in QHSPL (although they don't seem to me to be a very convenient choice).
ATPS is not used heavily at Mt. Stromlo, so LWPL has not been user-tested as much as I would like. My experience with other PostScript front ends suggests that some plots (e.g., very large number of vectors or pixels) may die in the laserwriter. If this happens, it could be fixed by improving the garbage collection in the printer (more save/restore pairs) at the cost of longer execution time.
My general philosophy has been to minimize host processing and maximize reliability, perhaps at the cost of increased processing time in the printer."
Files affected: LWPLA.HLP, APLVMS:ZLWIO.FOR and APGNOT:LWPLA.FOR.
Moved to 15APR87 as well.
4062. April 2, 1987 MAXFIT Eric
Changed the limit on PIXY from 1.0 to 0.0. Users are confused when INPUTS MAXFIT complains, even though the code works fine for zeros on all one-point axes. It won't work well if users enter zeros for the real axes. Added clarification about error handling to ISBATCH help file.
Moved to 15APR87 this date, nowhere else.

4063. April 2, 1987 Integer Constants in Calls Leroy/Kerry

Integer constants and expressions involving integer constants were found in some calls to subroutines and functions. These have been replaced with initialized INTEGER*2 variables with names of the form *Fn*. Calls to intrinsic functions containing integer constants were also fixed up to avoid mixed data types (a violation of the ANSI standard).

Routines changed:

in APGHOT	ABCAL	BLOAT	DCONV	GAL	GEOH	HGEOM
in AIPPGH	UPDAT					
in AIPGVHS	DICONV	GRKEY	GRSORT	HRTAPE	PRETHH	SURVEY
	ZVERPL					
in AIPSUB	AU5	AU5A	AU5C	AU8	AUA	AUB
	OERROR					
in APLPGH	CORER	GREYS	IBMTP			

Moved nowhere.

4064. April 4, 1987 image convolution Bill

New routines to convolve images: *APCONV*, *CONV1*, *CONV2*, *CONV3*, and *CONV4*. These are reasonably optimized routines, reading and writing the inner quarter of the image and the full FFTed convolving function. Unnecessary FFTs and I/O are eliminated; if the AP memory is large enough, temporary values are kept in memory.

Moved nowhere.

4065. April 4, 1987 CONVL Bill

Modified to use the new convolution routine *APCONV*. Now uses double size file to convolve gaussians; this will eliminate potential wraparound in the image. Also increased buffer sizes. Also changed *DCVL.INC*.

Moved nowhere.

4066. April 4, 1987 VM Bill

Modified to use *APCONV*, the new convolution routine for radio images. Also changed *DVMH.INC*, *IVMH.INC*.

Moved nowhere.

4067. April 4, 1987 IVAS Bob Sault/Eric

The characters produced when *YCHRW* wrote in the graphics planes were almost illegible. Bob discovered that, if they were written in "replace" rather than "OR" mode, they would be rather good. Made this change and changed *AU6B* (*CURVALUE*) to rewrite the black background after each position update. Otherwise, the background image began to show through. Also changed *AU5* to put in a time delay after *GRCLEAR* and *INCLEAR* commands. The *IVAS* was not completing the graphics clear when it was immediately reopened to do something else (as in the procedure *TVALL*).

Moved from *CONVEX* to *CVAX* and to 15APR87 this date.

4068. April 4, 1987 IIS Model 70/75 Eric

Changed *APLUNIX*, *APLCVEX*, and *APLVHS* versions of *ZH7OCL*, *ZH7OOP*, and *ZH7OXF* to do buffered I/O to the TV device. Renamed *ZH7OMC* to *ZH7OM2* (*C* in *UNIX*, *HAR* in *VMS*) and created *ZH7OMC.FOR* to clear the buffer and call *ZH7OM2*. Doing buffered I/O should be a great deal faster when we do many sequential writes to the device, as in drawing a diagonal line or writing text.

Moved from the *CONVEX* this date.

4069. April 6, 1987 DFTPL Tim Bastian/Kerry/Eric

Tim Bastian of the University of Colorado has submitted the task *DFTPL* with help file and includes now called *DDFT.INC* and *CDFT.INC*. The task and help were revised to include the new standard *DOCIRCLE* option and the call sequence of *CLAB1* was changed to include this parameter. *DFTPL* was written primarily to assist stellar observers interested in time variable phenomena (*e.g.*, outbursts on *RS CVn*'s, *dMe* flare stars, etc.). Since these stars are in general unresolved, it's often pointless to make a synthesis map for each time interval. Instead, after removing any confusing background sources from the *uv* data base, the user is interested in a single number for each time interval. The task *DFTPL* allows one to plot the direct fourier transform of the measured visibilities as a function of time for an arbitrary shift in *RA* and *DEC*. It will plot either points, points with error bars, or histogram format. The averaging interval is adjustable (*BPARN(2)*). The data time segment may be specified (through *APARN*). Hence, one can monitor all *Stoke's* parameters of a star with time *very* quickly, without having to resort to generating a tedious succession of maps.

Moved to 15APR87 as well.

4070. April 6, 1987

ARGS TV

Garagnon/Eric

An ARGS TV interface has been submitted by Bruno Garagnon, IRAM, Grenoble, France. He writes:
"About 'piping' the commands of another device, as you say in your last *AIPSLETTER* for LSPL and TKPL, that is what I did for the TV: we have here an ARGS image processor, and I found very more simple, although not perfect, to simulate your I²S in order to use the ARGS with *AIPS*, at least for the more important functions. While *AIPS* includes its own Operating System for I/O (to be processor-independent?), it is, for TV, strongly device-dependent!"
Editors' reply: "We're glad to receive finally an ARGS implementation that will do most of *AIPS*. I worry that the "pipe" form you've used will lead to some problems in that the ARGS is not an I²S Model 70. Any limitation or peculiarity of the Model 70 is then forced on the ARGS even in those areas in which the ARGS has a better design than the old Model 70. We disagree that *AIPS* is highly device-dependent. The Y routines are a device interface layer, like the Z routines, and constitute a Virtual Device in much the same way. When a new set of Y routines is written, all code above that interface should work as specified — and does in my experience barring errors in design."

Moved from France to CVAX, nowhere else.

4071. April 6, 1987

ARGS in AIPS

Garagnon/Eric

Bruno Garagnon shipped us a set of routines to replace ZH70XF for ARGS-based systems. We cannot do this, since we must retain ZH70XF for real I²S TVs. Thus, I have renamed his ZH70XF to ZARGXF, his ZH70HC to ZARGHC, and copied (older unbuffered) versions of the open and close routines to ZARGOP and ZARGCL. I have also copied all routines from YIIS: and YH70:. Of those, the following required a string substitution of ZARG for ZH70:

YALUCT	YCONST	YCRCTL	YFDBCK	YGRAM	YGRAFE	YIFH
YINGIO	YISDRM	YISDSC	YISJMP	YISMPH	YLUT	YHWHAX
YOFM	YRHIST	YSCROL	YSHIFT	YSPLIT	YSTCUR	YTVCLS
YTVHC	YTVOPH	YZOHC	ZARGCL	ZARGHC	ZARGOP	ZARGXF

Bruno supplied a "subroutine" called ARGS with many entry points which we have renamed ZARGS since it is full of calls to VMS system services. (Routines with entry points are discouraged in *AIPS* since it is hard to find code when the file name and the routine name do not match. A VLB task was made inoperative when a number of files were deleted since their names did not match any routine name in the system.) ZARGS required some editing: long lines were continued properly, continuation statements were moved to be in the correct columns, and the text was converted to upper case. The other routines placed in the YARGS: area are:

YCURSE	YCUCOR	YGRAPH	YGYHDR	YHKHDR	YTVCIH	YZERO
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The other changes which were required were to create the needed directories and link libraries and to modify AREAS.DAT and LIBR.DAT to define the logical and libraries.

Moved nowhere.

4072. April 6, 1987

LWPLF

Garagnon/Eric

An additional entry point to do rows of grey pixels was submitted. This entry is not used yet, but was submitted in the hope of a recoding of the grey pixel section of the main plotting routine (which now does one pixel at a time for some reason).

Moved to 15APR87 as well.

4073. April 7, 1987

VLBIN

Phil

Fixed call to TABCAL which was generating a CL table with all of the REAL1 column set to zero. Modified history routine slightly.

Moved nowhere.

4074. April 7, 1987

PRTAB

Phil

Defined a new adverb DOHHS which, when set to 1.0, will cause the time columns of tables printed with PRTAB to be in a human-readable form rather than in days, which is the internal form. Changed DAPL and CAPL includes and POPSDAT.HELP to define the adverb and created DOHHS.HELP.

Moved nowhere.

4075. April 8, 1987

VLBIN

Phil

Fixed so that it will check the input VLBI line data to see if the amplitude portion of the FBS correction has been done. If so, it will only do the phase correction. Also changed the includes DSET and CSET.

Moved nowhere.

4076. April 8, 1987

WSLOD

Eric

One more addressing bug was corrected: the improvement of the typing/coding fell for one of the traps built in to the previous style of coding.

Moved to 15APR87 this date.

4077. April 9, 1987

PRTAB

Phil

Changed PRTAB so it would also print time in hh:mm:ss.s form for **IX** tables. Modified help file and includes DPTB and CPTB.
Moved nowhere.

4078. April 6-10, 1987

Integer Constants in Calls

Leroy/Kerry

Integer constants and expressions involving integer constants were found in some calls to subroutines and functions. These have been replaced with initialized **INTEGER*2** variables with names of the form **IN**. Calls to intrinsic functions containing integer constants were also fixed up to avoid mixed data types (a violation of the ANSI standard).
Routines changed:

in APGBOT	IHFIT	JHFIT	NWFLT	HIBER	PFPL1	PFPL3
	PGEOM	SHOTH	SUMSQ	INGPL	MONHT	PRING
	QWRPL	TOVLB	VLBIN			
in APGVHS	TVCUB	TVSLD	VBAET	VBCIT	XPORT	
in QYPGH	APCLN					
in QPGBOT	CONVL	VBFIT				
in QYPGBOT	APGS	APVC	SDCLN	STEER		
in YIVAS	YCHRW					
in YPGVHS	HPORT	TVSLV				
in YPGH	TVPL					
in APLPGH	PROFL	PRTPL	PRTIM	PRTTP	QMSPL	SLFIT
	TRANS					
in APLSUB	BLDTM	CATIME	CHXP2	CHXP2	CLAB1	CLAB2
	EXTIUI	FILZCH	GIBIT	IWPC	HIBI3	SETLOC
	SLBINI	SHEVAL	TICIBC	TKLAB	TKTICS	TVWIND
	TXTHAT					
in APLUBIX	IMPFIT					
in APLBOT	DCODEF	MAETAB	RWTAB			
in YSUB	ITICS					
in YH70	YCURSE	YMKHDR	YRHIST			
in YV20	YSCROL					
in YH75	YCRCTL					
in QPSAP	QBOXSU					
in YPGHOT	TVHLD	TVHXF				
in YGEN	YCURSE					
in SYSCOS	READIT					
in APLHVMS	GRISUB	ZETASUBS				

Moved nowhere.

4079. April 10, 1987

WHATSNEW

Eric

Added some more of the new stuff to this help file.
Moved nowhere.

4080. April 10, 1987

CALIB

Phil

Modified trap for bad baselines and fixed bug when writing **SE** table. Also fixed **CLCAL**.
Moved nowhere.

4081. April 13, 1987

SPLIT

Bill

Changed **HUMPOL** in **SPLCOP** to a local variable. This was resetting **HUMPOL** used in **BLSET**, causing several commons to be trashed.
Moved nowhere.

4082. April 13, 1987

QVMS:FFT84X.FOR,R8TXX.MAR

Bob Sault/Bill

Added improvements Bob Sault made to **FFT842** (now called **FFT84X**) in the bit reversal and the assembler version of the radix 8 routine **R8TX** (renamed **R8TXX.MAR**). This version runs about 25% faster than the Fortran only version on **VAXes**. About half of the improvement comes from the better bit reversal method.
Moved nowhere.

4083. April 13, 1987

QVMS:QCFFT.FOR

Bill

Changed to use faster **FFT** routine **FFT84X**.
Moved nowhere.

4084. April 13, 1987 QPSAP:QCSQTR.FOR Bill
Made some minor improvements in an attempt to speed it up.
Moved nowhere.
4085. April 13, 1987 UVAVG Phil
The UT was being calculated from IAT, wrongly causing the program to produce useless data. Fixed.
Moved nowhere.
4086. April 14, 1987 SYSVLAC1:QMSPORT.HDR Dale King
The QMS QUIC pass terminator (^PF~-) must be on a line by itself, else QUIC mode is not terminated and files which contain a caret are cobbled up, sometimes interfering with subsequent files. Problem noted on Cholla when EXPLAIN was used on items that discussed control characters.
Moved nowhere.
4087. April 14, 1987 SYSVLAC1:QMSLAND.HDR Dale King
See previous item (# 4086).
Moved nowhere.
4088. April 15, 1987 QPSAP:QCSQTR Bill
Replaced apparently defective new version of QCSQTR with an older, working version. This affected tasks using 2-D FFTs especially UVMAP, VH, and VTESS.
Moved nowhere.
4089. April 15, 1987 UVFND, CALIB Kerry
Changed UVFND to accept autocorrelation data, i.e., data with antenna 1 the same as antenna 2. Also corrected a format overflow in CALIB.
Moved nowhere.
4090. April 15, 1987 APLUNIX:ZTRLOG Kerry
This is a routine designed to eventually replace the old UNIX "logical" translating routine ZXTLOG. It has a calling sequence that presumes nothing (e.g., lengths of character arguments) and can be called with equal ease from both Fortran and C. The calling sequence differs from the VMS Fortran version where translations are done via system service calls and CHARACTER argument lengths are available via the LEN function. Logical names are restricted to 48 characters to accommodate the worst case situations that arise in AIPS (e.g., VERSION) and translations are restricted to 128 characters, which should be generous enough. The 1-relative position of the last non-blank character in the translation is also returned, eliminating any need to do post-call "trimming".
Moved to 15APR87 same date.
4091. April 15, 1987 UNIX AIPS, BATER startup procedures Kerry
Changed the AIPS and BATER start up procedures in SYSUBIX (generic) as well as the custom versions in SYSBRA01 (C'ville CONVEX) and SYSVLAC1 (VLA CONVEX) to simplify running under the control of a debugger, running a "local" version of AIPS (or BATER) and to accommodate multi-TV device environments. Debug execution works as it used to except that, if the debugger environment variable DBUGR is not already defined or the specified debugger cannot be found, the user is prompted for the desired debugger to use (e.g., "adb", "sdb", "dbx", etc.). The user is also queried whether to run AIPS (or BATER) itself under the control of the debugger in addition to tasks, in which case, a second environment variable is set called AIPSDBUGR (or BATERDBUGR) that used by ZACTV9 and ZABORT to determine execution mode and abort handling. Running both AIPS (or BATER) in debug mode as well as tasks can be confusing and is not recommended since interrupts are captured by both the parent and child processes. It can be done, but it won't work like VMS debug mode and never will. If the LOCAL option is selected, an environment variable called AIPLOCAL (or BATERLOCAL) is defined as the current working directory. ZSTRTA (or ZSTRTB) will then override the version returned by ZHYVER and pass the local directory to ZACTV8 to initiate the desired executable.
Moved to 15APR87 same date.
4092. April 15, 1987 AIPGUNIX:ZSTRTA and ZSTRTB Kerry
Changed to simplify starting up local versions of AIPS and BATER. If an AIPS (or BATER) session is initiated using the "LOCAL" option, the environment variable AIPLOCAL (or BATERLOCAL) is defined as the current working directory. If ZSTRTA finds that AIPLOCAL is defined, it uses its translation as the version argument to ZACTV8 instead of the version normally determined by ZHYVER. ZACTV8 then uses this value to build the full path name to the desired local version of AIPS.EXE. Similarly, ZSTRTB does the same to build the full path name to the desired local version of BATER.EXE by translating the environment variable BATERLOCAL.
Moved to 15APR87 same date.

- 4093.** April 15, 1987 APLUNIX:ZACTV8 *Kerry*
Updated to stay in step with the VMS version. It no longer calls ZDIR, but rather does its own path-name construction locally via calls to ZTRLOG. It also cycles through load libraries in search of the proper load module (e.g., real versus pseudo AP, multi-TV device environments, etc.).
Moved to 15APR87 same date.
- 4094.** April 15, 1987 APLUNIX:ZACTV9 *Kerry*
Changed the calling sequence such that the length of character arguments are explicitly passed. Also changed the logic for debug mode execution. AIPS and BATER (as initiated by ZSTRTA and ZSTRTB, respectively), are executed under control of a debugger only if their respective debug environment variables are defined (i.e., AIPSDBUGR and BATERDEBUGR). The definition of the environment variable DEBUGR is still used to determine whether tasks are executed in debug mode. All debug executions are initiated such that the name of the program involved is used to rename the process from the name of the debugger to the AIPS process naming convention. The debugger will then come up with prompts containing the process name in parentheses rather than its own, for example, (HX1) instead of (adb). This eliminates the process ambiguity that would otherwise arise when running both AIPS (or BATER) and sub-processes in debug mode.
Moved to 15APR87 same date.
- 4095.** April 15, 1987 APLUNIX:ZWHOMI *Kerry*
Updated to stay in step with the VMS version, only one step further by going ahead with the planned elimination of the "primary" and "secondary" business in regard to TV and Tektronix device access priorities (they were only social statements anyway). Prior to these changes, AIPS REMOTE would not work for UNIX implementations.
Moved to 15APR87 same date.
- 4096.** April 15, 1987 UNIX versions of LIBR.DAT *Kerry*
This crucial programming file has undergone a format change. It now allows for definitions of multiple object library replacements (i.e., for modules that are the same in different object libraries, like generic Y-routines) and the generation of multiple load modules (i.e., linked with different combinations of object libraries, for example, as required for systems with more than one TV device model). To distinguish definitions, the mapping of subroutine source code to object code libraries, as well as the mapping of program source code to the object libraries required for linking, are separated by a digit sandwiched between two colons. The digit serves to indicate combinations according to the load module search as prescribed in ZACTV8. For example, "2" means pseudo AP plus second TV model. This is only of use to those installations with diversified hardware configurations, but must be provided for nevertheless. LIBR.DAT in SYSUNIX, SYSALLE, SYSNRA01, SYSALLE and SYSSUE were all changed to reflect the new format.
Moved to 15APR87 same date.
- 4097.** April 15, 1987 SYSUNIX:COMLNK and LINK *Kerry*
COMLNK was changed so that it returned same error as returned by LINK. Otherwise, errors in the link step could go unnoticed. LINK has also been changed to accommodate the new format of LIBR.DAT and will now perform multiple links with different combinations of object libraries and store the resulting executables in the proper load libraries.
Moved to 15APR87 same date.
- 4098.** April 15, 1987 SYSUNIX:COMRPL, AS, CC and FC *Kerry*
Cured the same problem that COMLNK had with processing error returns from LINK only in the case of COMRPL, it involved error returns from AS (assembly), CC (C compile) and FC (Fortran compile). Also, COMRPL now stages multiple copies of object code for replacement in multiple object libraries on systems where this is required (e.g., generic Y-routines for different TV model object libraries).
Moved to 15APR87 same date.
- 4099.** April 15, 1987 SYSUNIX:SEARCH, LIBS and MAKEAT *Kerry*
With the new LIBR.DAT format, SEARCH, LIBS and MAKEAT must necessarily behave differently. In particular, SEARCH now creates as many SEARCHn.DAT files as there are distinct ":n:" definitions in LIBR.DAT (where n=0 represents the default search path). As a result, what was known as SEARCH.DAT is now SEARCH0.DAT. It now takes an optional "alternate" search path argument (default is "0"). This is how COMRPL and COMLNK (in combination with LIBR.DAT and the SEARCHn.DAT files) determine which source code areas and object libraries to use. LIBS also now takes an "alternate" option to get alternate object library link lists, if defined (it defaults to "0"). For example, "2" means display the object library link list for pseudo AP plus second TV model. MAKEAT simply recognizes that it must search more than one set of directories if any alternate paths are defined in LIBR.DAT.
Moved to SEARCH and LIBS 15APR87 same date. Required change for MAKEAT was discovered after 15APR87 was frozen on CVAX, but it did make it onto the UNIX installation tape for 15APR87.

4100. April 15, 1987 SYSUNIX:LIBR *Kerry*
Changed to take an optional "logfile" argument. Formerly, object library update messages were not being recorded in the execution log files of `COHLER` and/or `LINK`.
Moved to 15APR87 same date.
4101. April 15, 1987 SYSUNIX:PRINTENV *Kerry*
It turns out that "printenv" is Berkeley UNIX specific. However, it was used by many of the *ATPS* programming scripts to make the use of environment variables more like the use of VMS logicals (when will I learn not to give in to the VMS freaks). To save myself from this one, I've written a version of "printenv" that should work for all UNIX systems.
Moved to 15APR87 same date.
4102. April 15, 1987 APLSUB:PLNGET and APLNOT:PLNPUT *Kerry*
Changed the local variables used for array indices within vectorizable loops from `INTEGER*2` to `INTEGER*4`. Otherwise, execution time conversions take place that cause such loops to execute much, much slower. There are many, many other cases of this throughout *ATPS* code that will ultimately be cured if and when we go to simple `INTEGER` declarations. Until then, there is no point in vectorizing any *ATPS* code on a CONVEX (and probably other vector register machines) other than the Q-routine library where everything is already `INTEGER*4`.
Moved nowhere.
4103. April 15, 1987 Kludges for SYSNRAO1 and SYSVLAC1 *Kerry*
The CONVEX Fortran compiler V2.2 fails on about a dozen programs with "assertion failures". `KC` (Kludge Compile) is a script that will detect such failures, create a temporary directory, move the problem code there, split the source code into separate modules for each program unit, compile each program unit separately, build a single object module in the original directory from the collection of resultant object modules, and finally delete all evidence of the temporary directory. This requires a custom version of `FC` (the normal procedure for Fortran compilations) which invokes `KC` when necessary. Since this made for a CONVEX-specific version of `FC`, I added two other features including the ability to merge compiler errors into the source code listing generated when the `LIST` option is selected. The `SYSNRAO1` and `SYSVLAC1` version of `FC` also examines a file in `SYSLOCAL`, called `OPT2.LIS`, which contains module names for which the default optimization level should include vectorization. This list includes the entire Q-routine library as well as other modules that contain significant vectorizable code (`CONV2`, `PLNGET`, `PLNPUT`, `STFUE`, `UTESS`, `VH` and `VTESS` at the moment). This list will grow as we gain experience as to which modules can be safely and effectively vectorized. However, the use of `INTEGER*2` variables inside loops will be the limiting factor. Implementations of *ATPS* on other vector register machines may also benefit from this list.
Moved to 15APR87 same date.
4104. April 15, 1987 APLUNIX:ZDIR *Kerry*
Updated to be similar to the newest VMS version. Calls to `ZITLOG` have been replaced with calls to `ZTRLG` and calls to `ZIHEX` formerly used for user number conversion to hexadecimal have also been eliminated in favor of a local conversion technique. It will also try to translate the specified "version" as if it were a logical and if successful, it will use the translation. Otherwise, it will treat it as a literal directory name. Of course, this will only work if the actual directory path name contains nothing but upper case characters since *AIPS* always converts the `VERSION` string as specified by the user to upper case.
Moved to 15APR87 same date.
4105. April 15, 1987 APLUNIX:ZDCHIN, ZABORT and ZABOR2 *Kerry*
`ZABORT` is a new routine that is used to establish abort handling. It's intended to replace `ZESTEX` (whatever that stood for) and is only called by `ZDCHIN`. In addition, it can be used to invoke an illegal instruction as a debugging aid (e.g., when testing the validity of an input argument to a subroutine that otherwise has no error return). However, since this routine does not exist in all *ATPS* implementations, its use as an abort generator is currently restricted to other Z-routines. `ZABORT` makes use of the new debug environment variable scheme (see `SYSUNIX:AIPS` and `BATER` changes) to decide whether or not to establish an abort handler or not. For example, if the process is *AIPS* and `AIPSDBUGR` is defined, signal processing is not disturbed. Similarly, if `DBUGR` is defined and the process is not *AIPS* (or `BATER`), no abort handling is established. `ZABORT` defines `ZABOR2` as its abort handler (formerly known as `ZISIGC`, the UNIX Z-routine for signal catching).
Moved to 15APR87 same date.

- 4106.** *April 15, 1987* APLUNIX:ZTFILL Kerry
Formerly, the UNIX version of ZTFILL was a direct copy of the VMS version and, as such, took pains not to zero the event flags that had been carefully assigned in ZDCHIE to various FTAB entries. These event flags are of no use in UNIX and only served to confuse when FTAB was dumped during error processing. Now all FTAB entries are zeroed when a given LUN is closed.
Moved to 15APR87 same date.
- 4107.** *April 15, 1987* APLCVEX:ZSTAIP and ZSTAI2 Kerry
CONVEX provides utilities for allocating and deallocating tape drives, at least on a user (not a job) basis. This is how the ATPS software tape mount (i.e., the HOUNT verb) is implemented for CONVEX systems. However, users could exit AIPS (even logout), leaving tapes allocated and therefore unavailable to other users. ZSTAIP, which had formerly been a null subroutine, has now been changed for CONVEX systems such that when AIPSx exits normally, it will check for tape drives still allocated to AIPSx and query the user about deallocating and unloading them. In all cases, the drives allocated to a given AIPSx are deallocated, however, the user's response determines whether the tape is unloaded. This allows users to exit AIPS, for example, just to move to another terminal, without having to physically remount their tape(s). For the moment, an aborted AIPS (i.e., via ^C) has no chance to do this. I should probably provide for this in the abort handler.
Moved to 15APR87 same date.
- 4108.** *April 15, 1987* APLUNIX:ZERROR and ZERRO2 Kerry
These routines are intended to replace ZQMSG (VMS QIO error message handler). ZERROR calls ZERRO2 to get the message string associated with a given system error code. If given a non-blank file name, it will print the name of the file on which the error occurred. Similarly, it will dump the contents of the control block in FTAB for the file involved. For those system errors where no file is involved, the magic value of -999 should be passed for the argument that would otherwise be the file descriptor (-1 and 0 are legitimate values under UNIX. However, I suspect -999 is not legitimate for any operating system).
Moved to 15APR87 same date.
- 4109.** *April 15, 1987* UNIX AREAS.* Kerry
Added definition for new source code area YARGS in the SYSUNIX versions of AREAS.DAT, AREAS.CSH and AREAS.SH as well as in the SYSNRA01 and SYSVLAC1 versions of these files.
Moved nowhere.
- 4110.** *April 15, 1987* SYSNRA01:ASSNLOCAL.SH Kerry
Added the definition for the IVAS TV device as TVDEV2 as well as the Tektronix device associated with the AIPS2 station as TKDEV2.
Moved to 15APR87 same date.
- 4111.** *April 15, 1987* APLUNIX:ZMSGWR Kerry
This is a new Fortran routine whose sole purpose is to facilitate issuing messages via HSGWRT from routines written in C. It simply takes a message string and message level, copies the message string to HSGTXT via an internal read and calls HSGWRT. This is intended to avoid the non-portable trickery we had been using to achieve the same goal.
Moved to 15APR87 same date.
- 4112.** *April 15, 1987* APLUNIX:ZLWIO Kerry
A new, untested routine required by the new task LWPLA which is the counterpart of QHSPL for LaserWriters. It's nearly identical to ZQMSIO except for buffer sizes and the lack of a provision for a user-specified output file, however, it calls ZQMSCL to close the laser printer file. We could (and may) create a ZLWCL, but it would be virtually identical to ZQMSCL. What we really need is a generalized I/O interface for printing and plotting before the Z-routine situation for these devices gets totally out of control.
Moved to 15APR87 same date.
- 4113.** *April 15, 1987* UNIX ZESTEX and ZXSIGC Kerry
These routines have been replaced by ZABORT and ZABOR2 and have been deleted from all UNIX Z-routine directories including APLUNIX, APLBELL, APLBERK and APLALLJ in the case of ZESTEX and APLUNIX, APLUTS, APLCVEX, APL4PT2 and APLSUH in the case of ZXSIGC.
Removed from 15APR87 same date.

4114. *April 15, 1987* File deletions from APLALLN *Kerry*
Alliant differs from all other UNIX machines that we have encountered in that the position of their "extra" arguments giving the length of character arguments at the Fortran/C interface is not the same. For this simple reason, many of our "generic" routines have not been portable to Alliant systems. The new calling sequence to ZACTV9 and use of ZTRLOG in ZACTV8, ZWHONI and ZDIR eliminate this problem for Alliant systems. Since the Alliant-specific versions of these routines are no longer necessary, they have been deleted. Other routines suffering from this problem will be corrected as time permits. The obsolete routine ZESTEX was also deleted.
Removed from 15APR87 same date.
4115. *April 15, 1987* APLUNIX:ZCRDIR and ZTAPIO *Kerry*
Changed the integer argument declarations for these routines from "short int" to "long int" since this is what is passed by IMPFIT (the only program that calls them).
Moved to 15APR87 same date.
4116. *April 15, 1987* APGUNIX:IMPFIT *Kerry*
Changed the declarations in the commented out examples of UNIX Z-routines to tell the truth.
Moved to 15APR87 same date.
4117. *April 16, 1987* VMS transport procs *Eric*
Changed TRANSPRT.COM to limit the files even more for 1600 bpi tapes; we cannot afford to ship three tapes! Also changed ICREOPT, ILOAD, IPROMPT, and IREBUILD procedures and the installation guide (called VGUIDE.REO and .MEM) to include the ARGS TV device.
Moved TRANSPRT only to 15APR87, the ARGS is not in that version.
4118. *April 17, 1987* DBCON *Phil*
Corrected yet another of the possible integer overflows.
Moved nowhere.

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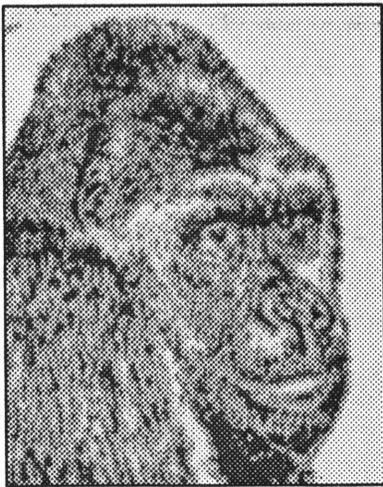
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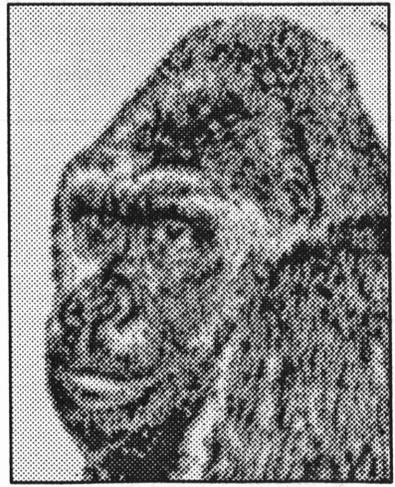
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April 15, 1987



A I P S L E T T E R

Volume VII, Number 3: July 15, 1987

National Radio Astronomy Observatory

A newsletter for users of the
Astronomical Image Processing System

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TeX macros by EWG

Exploding Bananas

Early in June the *AIPS* Group activated an E-mail “exploder” called “BANANAS”. This project is our response to discussion of the idea of an *AIPS* bulletin-board at the 1985 *AIPS* Workshop. Any E-mail sent to BANANAS is “exploded” to all *AIPS* sites on the BANANAS mailing list. Currently the list contains 65 *AIPS* sites, those which returned the 1986 site survey form with the network address filled in, plus a few others added since BANANAS was activated.

A wide variety of subjects have been discussed on BANANAS during the past 60 days, more than 30 messages so far: workstation Y-routines, plans for the *AIPS* Workshop, announcements of new tasks constructed at user sites, descriptions of newly announced computers, new Y-routines for several conventional displays, the Fortran 8X draft standard, a post-doc position advertisement, several bug fixes, and a discussion of misbehavior of the *AIPS* code which reads the cursor position of Tektronix terminals. We may summarize this traffic in the User’s Group column of the *AIPSLATTER* from time to time, but at the moment,

<p><i>we strongly</i> advocate that <i>every AIPS</i> site make a determined effort to acquire E-mail service and establish contact with NRAO in order to subscribe to BANANAS.</p>

Requests for new BANANAS subscriptions can be sent to `aipmail` at the addresses given above in our masthead, or to the “request” channel of BANANAS:

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A Personal Note

On the morning of Friday 17 July, Eric Greisen suffered a heart attack and was hospitalized. We are happy to report that Eric has returned to the office and is recovering well. This unfortunate event implies some changes for Eric and for the *AIPS* Group. For example, the "Code Overhaul" plan discussed on page 2 of the 15 April *AIPSCLETTER* will probably be delayed. The code release for 15JUL87 was coordinated by Kerry, with assistance from Bill, Leroy and Nancy. This *AIPSCLETTER* has also been much delayed.

Summary of Changes: 15 April — 15 July 1987

These changes are listed in detail in the `CHANGE.DOC` files reproduced later in the *AIPSCLETTER*. There are 132 changes this quarter. As in the previous quarter, these changes are led by corrections and improvements to the calibration package.

Changes of Interest to Users: 15JUL87 as NEW

In addition to the new tasks reported in the last *AIPSCLETTER* for 15JUL87, there is one more new task in the current release. It is called `MULTI` and is used to convert single-source *uv* files into multi-source *uv* files (see entry # 4146). Numerous bugs in `CALIB` were tracked down and corrected. Similar bugs in `VBFIT` and `VSCAL` were also uncovered (entry #s 4167 and 4168). In addition, `ASCAL` and `VSCAL` were corrected to handle *uv* data sets having more than one IF (#s 4161 and 4162). `DBCON` can now concatenate multi-source *uv* files as well as single-source files (# 4152). With these corrections, we believe that *AIPS* has been restored to full functionality for VLBI data reduction.

Changes of Interest to Users: 15OCT87 as TST

There are five new tasks in the 15OCT87 release (so far). The most significant of these is `TVFLG`, an interactive, television-based *uv* data editing task (# 4242). A related task called `UVIMG` grids *uv* data in any sort order into a cataloged image (# 4219) which can then be transposed, displayed, etc. as desired. `SQASH` compresses *m*-dimensional images by adding or averaging planes (# 4221), an operation which is of special interest for spectral line cubes and for the output of `SQASH`. `MATHS` performs mathematical functions on single images (#s 4171, 4173) and `PADIM` increases an image by surrounding it with a user-specified constant (# 4178).

There were some significant changes in the tape routines, most of which should be invisible to the user. However, the pseudo-tape disk files for FITS-format data have been considerably improved (entries # 4187 through # 4193). `TPHEAD` now also supports the pseudo-tape disk files. The parameter `FORMAT` for `FITTP` was changed into two parameters, `FORMAT` and `BLOCKING` (# 4187). And the adverb `LSRVEL` was renamed `SYSVEL` (# 4218).

Changes of Interest to Programmers: 15JUL87 as NEW

Very little was changed in 15JUL87 that should affect programmers. Of some interest are corrections to VMS procedures for installation and for defining `LOCAL` area logicals (entry #s 4141 and 4142).

Changes of Interest to Programmers: 15OCT87 as TST

As part of a major rewrite of the `Z` routines, we have redone the tape `Z` routines. They now have a generic top level to handle error testing and the calling of lower-level, machine-dependent routines. The latter are broken into small, relatively simple routines in most cases. In particular, for pseudo-tape disk files, we have now a full set of routines to open and handle Fortran, direct-access data sets producing FITS disk files with no excess bytes. `ZTPOPN` has a new call sequence. See entries # 4185 through # 4193.

Calibration and Editing in 15JUL87 *AIPS*

The 15JUL87 release of *AIPS* contains a basic package of calibration and editing tasks for unpolarized continuum data. This package should be useable for all interferometers, both connected-element and VLBI. These routines have now been used for a number of projects and appear to be ready for general use. This package of routines is patterned after the VLA Dec-10 calibration package; the correspondence of programs and file types is given below:

Dec-10	<i>AIPS</i>	Function
ANTSOL	CALIB	Determine antenna based calibration.
DBCON	DBCON	Concatenate <i>uv</i> data files.
FLAGER	UVFLG	Flag bad <i>uv</i> data.
FILLER	FILLR	Load VLA data from a Modcomp tape.
GTBCAL	CLCAL	Apply solutions from (ANTSOL/CALIB) to gain/calibration table.
GTBCOR	CLCOR	Apply corrections to gain/calibration table.
LISTER	LISTR	Print selected portions of a <i>uv</i> data file.
PASSUM	POSSM	Average spectra in <i>uv</i> plane.
SETJY	SETJY	Enter source information into source table.
.CAL	SN	Table containing antenna-based solutions for interpolation into gain (calibration) table.
.GAI	CL	Table containing gain corrections to be applied to data.

A basic feature of this system is that all data at a given observing band may be kept in a single, multi-source *uv* data file. Calibration and editing consist of manipulating tables until the user is happy with the results and then task SPLIT will apply these tables and produce calibrated and edited single-source files in the traditional *AIPS* manner. The multi-source *uv* data files and all calibration and editing related tables may be written to FITS format files. This calibration package keeps track of the geometry-related information such as group and phase delays and their time derivatives so that this information may be used to solve for source and antenna locations, etc. or to improve the geometric model applied to the data.

The general HELP file CALIBRAT describes the functions available and recommends detailed procedures for calibrating and editing VLA and VLBI continuum data. A *COOKBOOK* chapter will be developed for this, and user comments are very welcome at this stage. Send them to Bill Cotton or to Alan Bridle. Programmer documentation for this package is included in the 15APR87 version of Volume 2 of *Going AIPS*.

Additional calibration and editing features in 15OCT87 *AIPS*

The calibration and editing package in *AIPS* will be expanded by the addition of a number of features in the 15OCT87 release. The most important of these is the task TVFLG which allows interactive editing of *uv* data using a television. Selected portions of a *uv* data file may be converted into an image which is then used to interactively select data to be flagged. Other enhancements are the addition of polarization calibration, spectral line bandpass calibration, tasks designed to calibrate spectral line VLBI data and proper support of FITS files on disk.

AIPS Users' Group Column

The third *AIPS* Workshop (14–16 September) will have been held at Green Bank by the time most of you receive this *AIPSCLETTER*. We expect to report on it in a future *AIPS* memo.

Electronic Mail Issues Related to *AIPS*

The official connection of NRAO to NASA's SPAN (Space Physics Analysis Network) occurred early in June, and obsoleted our old unofficial SPAN connection. The new address for *AIPS*-related mail is:

`6654::aipsmail`

The UUCP backbone node "seismo" will no longer be available after the beginning of September for use as the UUCP-to-ARPAnet gateway; its function will be served by host "uunet" (which is also known as "uunet.uu.net" on the ARPA-Internet). We suggest using the following UUCP address:

`...!uunet!nrao1!aipsmail`

The Portability Column

Image Displays

IIS DR-11 Interface: IIS is offering a new optional product called "GPIT" (General Purpose Interface Translator). The GPIT allows IIS image displays to interface to host computers using the classical DEC DR-11 protocol. It will be *much* easier to connect IIS displays to new types of computers in the future, as DR-11 controllers are available for most of the popular I/O busses. For example, both Convex and Alliant market and support DR-11 controllers manufactured by Ikon Data Systems of Seattle, WA.

Vector-Concurrent Computers—Recent Events

Until six months ago the mini-supercomputer market had only a few vendors, of which Convex and Alliant were most visible. Several new vendors have entered the market recently, one has ceased production and a rumor about a traditional vendor entering the market has been confirmed:

Multiflow "Trace": This machine was announced in March and was demonstrated at the Santa Clara Supercomputer Meeting in May. *AIPS* sites in the U.S. who are in the market for an *AIPS* engine in the US\$150K or more price range should contact Multiflow. The Trace machines are examples of the "VLIW" (Very Long Instruction Word) architecture; essentially they are like a group of FPS-120B APs executing concurrently. The technology depends critically on "trace-scheduling" compiler technology. The large configurations of the Trace series challenge the Convex and Alliant systems on an absolute performance basis, while Multiflow claims that their systems currently offer the best price-performance ratio in the mini-super industry. Multiflow is aware that the *AIPS* market exists; certification and benchmarking results are not yet available. See the first page of the July-August issue of *American Scientist* for a recent Multiflow advertisement. (Multiflow Computer, Inc., 175 N. Main, Branford, CT 06405, 203-488-6090)

Gould "NP1": Gould announced its NPL (New Processor Line) computer systems in March. The current model, the "NP1", is finishing "beta test". The Gould machines are conventional vector register computers, analogous to the Convex systems. Future versions will also have concurrency, analogous to Alliant. Performance is said to be in the range of the C-1. The price-performance ratio of the NP1 relative to the Convex and Alliant systems is not yet clear; *AIPS* certification and benchmarking results are not yet available.

Gould has international marketing and support capability because of its SEL product line. (Gould, Inc., Computer Systems Division, 6901 W. Sunrise Blvd., Ft. Lauderdale, FL 33313-4499, 305-587-2900)

Cydrome "Cydra-5": Cydrome exhibited at the Santa Clara show in May and the trade press has discussed the fact that Prime Computer will market its "Cydra-5" model system (under the Prime label) worldwide. The first systems will enter beta-test during the next few months. The Cydra-5 is another VLIW machine, analogous to Multiflow's Trace. Its single precision pipeline power is 50 MFLOPS peak (compared to 40 for the Convex C-1), and its specialty (as with Multiflow) is scalar concurrency. Cydrome also claims a price-performance advantage over the conventional vector architectures. The Prime connection means that Cydrome has immediate worldwide marketing and support for the Cydra-5; non-U.S. *AIPS* sites should contact their local Prime sales representatives for information. (Cydrome, Inc., 1589 Centre Pointe Dr., Milpitas, CA 95035, 408-945-6300)

Culler "Culler-7": This series of computers was reviewed in the 15JAN86 *AIPSLATTER*. Recently Culler ceased all manufacturing of its Culler-7 models and cut back its staff to about 12. They are believed to have installed 16 systems; maintenance and service on these is ongoing as Culler seeks a buyer. (Culler Scientific Systems, Santa Barbara, CA)

DEC Vector-VAX: **Electronic News** for Monday June 29th stated: "...DEC confirmed it will come out with an integrated vector facility for its processors. The company maintained the development project is on schedule, but declined to discuss any dates. The company said, however, that it will be 'much better' than Convex and Alliant..."

SCS "SCS-40": SCS has indicated that it expects to offer UNIX support, probably in 1988; this may make its systems more attractive as candidates for *AIPS* installation (Scientific Computer Systems Corp., 10180 Barnes Canyon Rd., San Diego, CA 92121, 619-546-1212)

The Multiflow, Gould and Cydrome systems have UNIX operating systems, and it is reasonable to expect that *AIPS* could be installed on any of these three systems fairly easily. The principal uncertainties for *AIPS* installations on new UNIX-based systems involve the Fortran compilers, *not* the operating systems. NRAO is aware of several more vector-concurrent computers which are likely to be announced during the next six months. We also note that several conventional workstations which now use Weitek pipelined-FP chips need only vectorizing compilers to become "vector-workstations" — it will be no surprise to see one or more announcements of such capabilities during the next 12-18 months.

Please note that our mentioning of the availability of these products does not constitute any sort of endorsement of them. Also, this review is based on our current understanding of these complex and evolving systems.

AIPS Publications

The Order Form at the end of this *AIPSLLETTER* may be used to order the following memoranda and books. All previous memoranda are also available. Both volumes of the new edition of *GOING AIPS* are now available. If you have already ordered this new edition, please do not repeat your order.

AIPS Memo No. 51: "The NRAO *AIPS* Project - A Summary," Alan H. Bridle, May 1987.

This memorandum provides a concise (three pages) overview of the history, scope, implementation strategies, and plans of the *AIPS* Project.

AIPS Memo No. 52: "The 1986 *AIPS* Site Survey," Alan H. Bridle, Donald C. Wells, Nancy D. Wiener, June 1987.

We use data from the 1985 and 1986 *AIPS* Site Surveys to assess the size and geographical distribution of the machine power devoted to *AIPS*, and its growth between the two surveys. We summarize responses from the *AIPS* sites about their future plans, and discuss some consequences for planning NRAO's *AIPS* effort.

CHANGE.DOC: 15JUL87 Version as NEW

- | | | |
|---|-----------------------------|-------|
| 4119. April 27, 1987 | REMAC | Neil |
| Fixed bug so that header scale and offset factors are correct.
Moved from TST this date. | | |
| 4120. April 28, 1987 | FC in SYSNRAO1 and SYSVLAC1 | Kerry |
| The temporary file used for collecting compiler errors (warnings and otherwise) was not being deleted.
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX. | | |
| 4121. April 28, 1987 | CLUPDA | Bill |
| Fixed several bugs which caused CLCAL to fail for OPTYPE='HERG'.
Moved from 15OCT87 this date. | | |
| 4122. April 28, 1987 | SYSUNIX:LINK and COMRPL | Kerry |
| Mods made to accommodate the new LIBR.DAT format introduced an error where error processing was being mis-handled. "Breaks" from inner loops were not exiting all loops such that both success and failure were being reported and actions normally taken on success were being executed (e.g., the automatic editing of "@" files).
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX. | | |
| 4123. April 30, 1987 | APLUNIX:ZXMKTM | Kerry |
| This routine had a reference to the function "index" which is Berkeley UNIX specific. This has now been changed to a loop to find the first occurrence of the desired character.
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX. | | |
| 4124. May 8, 1987 | APLUNIX:ZDIR | Kerry |
| Corrected error in the construction of the file name extension for RUF files (i.e., user number in hexadecimal).
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX. | | |

4125. May 8, 1987 ZDCHIN in APLCVEX and APLALLN Kerry
The preprocessor for Convex and Alliant implementations does not transform declarations of LOGICAL*2 to simple LOGICAL as in the case for all other UNIX implementations. However, the value assigned to WWDPL0 (number of words per logical) in ZDCHIN was still "2". This has been corrected to "1" in the extant Alliant-specific version and a Convex-specific version has been created with the proper value. This is simply a stop-gap measure until we either convert to ANSI standard declarations (i.e., no more type*n) or include LOGICAL*2 to LOGICAL transformations in the source code preprocessing for Alliant and Convex systems.
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX.
4126. May 18, 1987 DOCTXT:UGUIDE.RNO and UGUIDE.MEM Kerry
Updated the *ATPS* installation guide for UNIX systems to reflect the 15APR87 release.
Moved to 15OCT87 same date. This change also made it on the 15APR87 installation tape for UNIX.
4127. May 22, 1987 SOUFIL Bill
Fixed bug in logic for specifying "all sources except the specified list". The minus sign was not being stripped off of the source name.
Moved from 15OCT87 this date.
4128. May 25, 1987 CGASET Bill
Cleaned up test for blanking in the determination of the delay and rate error correction factors. This problem was causing many sine argument range errors on the Convex.
Moved from 15OCT87 this date.
4129. May 26, 1987 EXTLIST Eric
Corrected AUBA to account for earlier changes in the inputs to UVPLT and VBPLT. When the inputs to plot-file-producing tasks change, corresponding changes to EXTLIST *must* be made. The UVPLT correction was simple: adding 1 to all offsets larger than 8. However, VBPLT is no longer parallel to UVPLT and requires a whole new section of code. Furthermore, VBPLT now has so many input parameters that they no longer fit in the one plot-file record reserved for them. Fixed the code to handle the new inputs and to look for this overflow. No long term fix is needed since the conversion to INTEGER*4 will remove the problem.
Moved from 15OCT87 this date, nowhere else.
4130. May 28, 1987 CSLGET Bill
Work-around for Convex compiler bug. If there are nested do loops with mixed INTEGER type induction variables and the outer loop branches to the end before entering the inner loop, then the inner loop is entered at the end. CSLGET contained 2 instances of this; a separate end statement was added for the outer loop.
Moved from 15OCT87 this date, nowhere else.
4131. May 28, 1987 CLUPDA Bill
Output smoothed SF tables were being deleted for single-source files.
Moved to 15OCT87 this date, nowhere else.
4132. May 29, 1987 QCVMMMA Bill
The version of this routine in QPSAP had a ZVHD.INC include in spite of a dependence; this was causing an error in the gridded fringe search in CALIB (and VBFIT if it works) on the Convex. An improved version has been added to QVEI which avoids the dependency problem. The version in QPSAP has the ZVHD.INC removed.
Moved from 15OCT87 this date, nowhere else.
4133. May 29, 1987 CALIB Bill
Changed all of the integers in the LINPACK routines to INTEGER instead of INTEGER*2. Type mismatches were screwing up some of the least squares solutions on the Convex; on the VAX, INTEGER defaults to INTEGER*2 so the problem doesn't occur.
Moved from 15OCT87 this date, nowhere else.
4134. June 5, 1987 CALIB Bill
Fixed an incorrect test in CLBSRC checking to see if there was any data for the reference antenna; the test was to see if the sum of all weight on that antenna exceeded 1.0, the correct value is more like 1.0E-20. Also fixed more inconsistencies in the integer types in the LINPACK routines and the routines calling them. Also modified CLBSRC to try a 1-baseline search if a multiple baseline search is done and fails.
Moved from 15OCT87 this date, nowhere else.

4135. June 9, 1987 VBCIT Bill
The call to `ANTINI` did not have properly initialized arguments.
Moved from 15OCT87 this date, nowhere else.
4136. June 9, 1987 CALIB Bill
The baseline weights for fringe fitting are normalized in `CLBSRC` so that the input data weights do not influence the importance of delay and rate constraints in the least squares solution. The old method caused the delay and rate constraints to dominate the solution when the amplitudes had been calibrated. Also fixed a bug in the handling of `UVRANGE`, the values were not being multiplied by 1000 as advertised.
Moved from 15OCT87 this date, nowhere else.
4137. June 10, 1987 DGHEAD Bill
`VISCHT` was not being called for multiple sources. This was causing `CALIB` to create a scratch file the size of the full data set when multiple calibrators were being used.
Moved from 15OCT87 this date, nowhere else.
4138. June 11, 1987 CALIB Bill
`GASOLV` was scaling rates to sec/sec even when the values were blanked, thus causing them to become unblanked. This was only a problem in `LISTR`; application of the solutions ignored these records because the rest of the entry was blanked.
Moved from 15OCT87 this date, nowhere else.
4139. June 11, 1987 CALINI, SNINI Bill
Corrected the units for residual delay and rate in `CALINI` (they were reversed). Corrected the spelling of "INITIALIZED" in the error message generated by `SHINI` and `CALINI`.
Moved from 15OCT87 this date, nowhere else.
4140. June 12, 1987 IRING Eric
Changed scaling of max and min to the plot routines. The old code would blow up if the image was all negative.
Moved from 15OCT87 this date, nowhere else.
4141. June 12, 1987 VMS Installation Scott Allendorf/Eric
Changed `ICREOPT.COM` to remove the reference to the non-existent `AIPVMS` link library. Changed `VGUIDE.RNO` and `IBATCH.COM` to add `/NOPRINT/KEEP` to the description of the running of `IBATCH`. Otherwise, about 6 Mbytes of logfile get printed.
Moved from 15OCT87 this date, nowhere else.
4142. June 12, 1987 VMS Procs Eric
Changed `AIPS.COM` to allow fancy process names (with more quotes). Changed `ASS#LOCAL.COM` to define `LOCAL` in a manner similar to `TST` and redefine `LOCRRU`, `LOCLOD`, and `LOCSYS` in terms of it. Changed `ICREDCL.COM` to do the same at installation time. `ASS#LOCAL` had the `LOCAL` areas on the wrong disk in C'ville as well!
Moved from 15OCT87 this date, nowhere else.
4143. June 12, 1987 IIS Model 75 Scott Allendorf/Eric
The IIS Model 75 code was not fully corrected for the new handling of the OFM via a full set of parameters. Dropped a multiply by 4 in `YINIT` and excess copying of arrays in `YOFM`.
Moved from 15OCT87 this date, nowhere else.
4144. June 12, 1987 UPDAT Scott Allendorf/Eric
`UPDAT` had an error in the code to translate from old to A version which would cause it to rename some files from old to B in one step. This would leave other files floundering when the translation had to be more than one step (old to A and then to B). Corrected a call to `ZPHFIL` into one to `ZPHOLV (CHA...)`.
Moved from 15OCT87 this date, nowhere else.
4145. June 12, 1987 TAPIO, UVLOD Eric
Corrected bug in testing length of record read. The length is not returned for disk and has to be set in advance everywhere. Also added `PUVD.INC` where needed in `UVLOD` and corrected addressing problem in `UWRITE (TPHEAD` for Export tapes). The new tape handling in the 15OCT87 release does not have these problems.
Moved nowhere.

4146. June 22, 1987 MULTI Kevin Lind
New task: Converts single-source UV data files to multi-source uv data files, creating an SU and CL table. See help file for additional details. This program is required in order to apply a priori antenna calibration to data files which have been SPLIT or have come from the CIT correlator. Because of the importance of this program to the use of the VLBA package, it has been added to the NEW version of ATPS as well as the TST version.
Moved to the Vax only.
4147. June 22, 1987 Misc Brian Glendenning/Eric
Corrected: DAPL.IBC and CAPL.IBC to keep the number of continuation lines within bounds. Corrected common names to be different from subroutine names in APCLN, SDCLN, ASCAL, HX, VM, VTESS, and UTESS. Corrected misplaced parentheses in logical statements in ALGSUB (checking if data are in grid) and in SSMO (checking for non-zero amplitudes). Corrected overlong DATA statements in CALIB and GAIN by equivalencing shorter variables and DATA-ing them. Corrected VTESS changing ACOSD references to 57.2957*ACOS references (NEW version only).
Moved corrections only from 15OCT87 this date, nowhere else.
4148. June 22, 1987 DATCAL Bill
Fixed bug in counting if any data was good. If visibilities were even partially flagged the entire record was discarded.
Moved from 15OCT87 this date, nowhere else.
4149. June 23, 1987 VBPLT Bill
For some axis types various necessary parameters were not being set, resulting in the program blowing up.
Moved from 15OCT87 this date, nowhere else.
4150. June 23, 1987 UVFIX Bill
Changed format 2007 in UVWAL to 2F15.5 to avoid output conversion error writing history record telling the amount of the tangent point shift.
Moved from 15OCT87 this date, nowhere else.
4151. June 23, 1987 IVAS Eric
Changed: YTVIN to give the correct character size (12 by 22), YCHRW to write the characters 3 pixels higher in Y, and YSPLIT to allow all channels to be turned off. The latter involves a call to FIVASSELIMAGE following the call to FIVASDEFIMAGE. In principle, this is superfluous, but in practice it is needed to get all planes off.
Moved to 15JUL87 this date, nowhere else.
4152. June 25, 1987 DBCON Bill
Bad call sequence to SOUTI in DBSOUR was causing DBCON to fail when concatenating multi-source uv data sets.
Moved from 15OCT87 this date, nowhere else.
4153. June 26, 1987 TASK.HLP Bill
Added calibration- and editing-related routines.
Moved from 15OCT87 this date, nowhere else.
4154. June 29, 1987 LISTR Bill
Fixed several bugs: 'LIST' option now works for baselines for which the lower antenna number is given in BASELINE. The 'GAIN' option should not list 0 times. When multiple data types are listed with the 'MATX' option there will be less header information before the second set; this will make it easier to determine which sets belong together. OPTYPE='GAIN' should now work when a list of sources deselected is given.
Moved from 15OCT87, this date, nowhere else.
4155. July 1, 1987 UVLOD Bill
Fixed a number of problems in UVFHS involving reading antenna info from the history cards. The Pipeline now appears to write antenna information in this fashion. The uncorrected UVLOD was choking on these tapes.
Moved from 15OCT87, this date, nowhere else.
4156. July 1, 1987 ZMCACL Bill
Corrected bug in repeat count in APLVMS and APLVEX version. This was causing FILLR to blow up under some circumstances.
Moved from 15OCT87, this date, nowhere else.

4157. July 3, 1987 FILLR Bill
Corrected problems which caused source positions to be picked up from data in a subarray other than the one selected. This problem also caused the data not to be averaged properly when more than one subarray was on the tape. Also changed DMC. INC.
Moved from 15OCT87, this date, nowhere else.
4158. July 3, 1987 AIPCAL.HLP Bill
This help file is the first pass at online documentation for calibrating and editing *uv* data in AIPS.
Moved from 15OCT87, this date, nowhere else.
4159. July 9, 1987 APGNOT:LWPLA.FOR Kerry
Replaced calls to non-standard intrinsic IINT with ANSI generic intrinsic INT. Also replaced a Z format specifier with an A format specifier after translating to hexadecimal CHARACTER representation (Z format specifiers are not part of the ANSI standard).
Moved to 15OCT87 same date.
4160. July 14, 1987 SLICE Neil
The image header scale and offset factors were not being applied when reading floating point images.
Moved from 15OCT87 this date, nowhere else.
4161. July 15, 1987 ASCAL Phil
ASCAL died if the input data set had an IF axis, since the extension type held in the map header common was blanked out before being accessed to look for CH tables. Fixed.
Moved from 15OCT87, this date, nowhere else.
4162. July 15, 1987 VSCAL Phil/Fred
Fixed same problem as was in ASCAL. In addition, the call sequences to the least-squares gain solution routines were totally screwed up. Fixed.
Moved from 15OCT87, this date, nowhere else.
4163. July 15, 1987 PRTAB Phil
PRTAB was not recognising values in tables which were blanked. It now prints the word 'INDE' when encountering one.
Moved from 15OCT87 this date, nowhere else.
4164. July 15, 1987 CALIB Phil
There was a type mis-declaration in subroutine SEVAL which was causing the SNR's to be calculated wrongly; fixed.
Moved from 15OCT87 this date, nowhere else.
4165. July 16, 1987 Y routines Eric
Changed:
YCURSE — (YM70) The zoom correction seemed not to be quite right yet again (has something changed?). Corrected output by 1.0/MAG pixels.
YCUCOR — (YM70) Made the corresponding changes.
YFILL — (YIVAS) Corrected call sequence to FIVASMAIMAGE. TVFLG must be the first task to use YFILL on grey planes.
Moved from 15OCT87 this date.
4166. July 17, 1987 ANCAL.HLP Phil
Inserted warning in the ANCAL HELP file concerning the use of the E-format in the calibration text file. The keyin routines cannot yet cope with this.
Moved from 15OCT87 this date, nowhere else.
4167. July 17, 1987 VBFIT Phil
Changed all of the integers in the LINPACK routines to INTEGER instead of INTEGER*2. Type mismatches were screwing up some of the least squares solutions on the Convex. Also fixed several small bugs which were causing problems on the Convex (I*2 again)
Moved from 15OCT87 this date, nowhere else.

4168. July 17, 1987 VSCAL Phil
Changed all of the integers in the LINPACK routines to INTEGER instead of INTEGER*2. Type mismatches were screwing up some of the least squares solutions on the Convex.
Moved from 15OCT87 this date.

CHANGE.DOC: 15OCT87 Version as TST

4169. April 24, 1987 QYPGNOT:VTESS.FOR Tim
Put in Bill's new APCOHV routine, which should save about 20% in CPU and run time. Also changed handling of PBSIZE so that primary beam correction is only performed if PBSIZE(I) > 0. Then if the header shows that the telescope used was 'VLA', the VLA primary beam model is used, and PBSIZE(I) ignored. Otherwise, a Gaussian primary beam is used, with PBSIZE(I) being the FWHM in arc-seconds. As before, PBSIZE(I) = 0 means no correction, and PBSIZE(I) < 0 means that the data is from a single dish.
I also cleaned up the INCLUDE files to remove extraneous variables. The INCLUDE file INC:IVHT.INC is defunct and should be removed from the system. Also changed HELP file.
Moved nowhere.
4170. April 24, 1987 POSSM Phil
Inserted new subroutine to cope with velocity labels correctly; also enabled the program to cope with plotting autocorrelation data correctly. Updated the help file.
Moved nowhere.
4171. April 26, 1987 MATHS Neil
MATHS (MATH for you Americans) is a new task that operates on your image with one of a variety of simple mathematical functions. Currently implemented are: SIN, COS, TAN, ASIN, ACOS, ATAN, LOG, ALOG, LOGE, EXP, POLY, and POWR. POLY forms the output pixel from a polynomial combination of the input pixel (this could be used to calibrate optical photographic images from density to intensity) and POWR lets you raise pixels by some power. Also a HELP file.
Moved nowhere.
4172. April 27, 1987 REMAG Neil
Fixed bug that occurs when input image has a scale factor that is not 1 or offset that is not 0. Output header scale and offset factors always 1 and 0 now, and always correct.
Moved to NEW this date.
4173. April 28, 1987 MATHS Neil
(1) Added additional operator MOD.
(2) Added option to blank undefined output pixels with zeroes instead of magic blanks.
(3) Made subroutine for checking stupid input windows cleverer.
(4) Changes reflected in HELP file.
Moved nowhere.
4174. April 28, 1987 FC in SYSNRAO1 and SYSVLAC1 Kerry
The temporary file used for collecting compiler errors (warnings and otherwise) was not being deleted.
Moved to 15JUL87 same date. This change also made it on the 15APR87 installation tape for UNIX.
4175. April 28, 1987 CLUPDA Bill
Fixed several bugs which caused CLCAL to fail for OPTYPE='MERG'.
Moved to 15JUL87 this date.
4176. April 28, 1987 VLBIN Phil
VLBIN was ignoring the advertised parameter which forced the recalculation of u, v and w. Fixed this and also reversed the logic so that the default is to recalculate and the deliberate setting of APARM(7) causes the original values to be passed. Also updated the help file to reflect this change.
Moved nowhere.

4185. May 12, 1987

Tape Z routines

Eric/Kerry

We have restructured the Z routines for handling tapes with the intention of making the highest level ones actually generic. We have also changed the pseudo-tape disk files to be handled by the ZTP... routines and have chosen, for VMS and UNIX, to make these files Fortran, direct-access, unformatted files. Such files seem to contain no excess control bytes and seem to pass unchanged through ftp, which will allow files to be passed easily between the Charlottesville machines anyway. Files involved:

- ZTPOPN — (GEN) Does error checking. Then, for real tapes, opens control file with ZDAOPN and tape with ZTPOP2 and, for pseudo-tape disk files, opens with ZTPOPD. System error messages are handled through ZERROR. New call sequence.
 - ZTPOP2 — (VMS) MAR routine based on ZQASSN.MAR with the MAP argument replaced by a MODE argument (not used by VMS).
 - ZTPOPD — (VMS) Opens Fortran direct-access file as new on write and as old on read.
 - ZDAOPN — (VMS) Renamed version of ZQOPEN.MAR.
 - ZERROR — (GEN) Attempts to translate the system error code into messages which may be meaningful to the users and programmers. Calls ZERRO2 to do this. Then prints the file name and file control block if requested.
 - ZERRO2 — (VMS) Calls SYS\$GETMSG to translate system message.
 - ZTPMIO — (GEN) Does generic error checking, then calls ZTPMI2 or ZTPMID.
 - ZTPMI2 — (VMS) Calls ZQIO to do actual IO to real tape device. Blocks/handles certain VMS-specific errors.
 - ZTPMID — (VMS) Reads/writes from Fortran direct-access file at logical record given in FTAB(IND+5-6). Places error in FTAB file control block rather than returning it.
 - ZTPWAT — (GEN) Does error testing, calls ZTPWA2 or ZTPWAD, picks up bytes read from file control block, and calls ZERROR if needed.
 - ZTPWA2 — (VMS) Calls ZQWIO to wait for real tape IO, then reports records that were too long but converts the error code to 0.
 - ZTPWAD — (VMS) Picks up error from file control block and checks for it being actually an end-of-file. No waiting is needed.
 - ZTPCLS — (GEN) Does error checking, then calls ZTPCL2 for real tapes, ZDACLS for the lock files for real tapes, and ZTPCLD for pseudo-tape disk files. Errors are handled through ZERROR.
 - ZTPCL2 — (VMS) MAR routine to deassign real tapes — a version of ZQDASS.MAR without the always true MAP argument.
 - ZTPCLD — (GEN) Closes pseudo-tape disk file via simple Fortran close.
 - ZDACLS — (VMS) Closes QIO disk files — a renamed copy of ZQCLOS.MAR.
- Moved nowhere.

4186. May 12, 1987

UNIX tape Z routines

Kerry/Eric

Made UNIX versions of the above. Removed obsolete versions of ZTPOPN and ZTPCLS from APLUNIX, APLBERK, and APLALLN and also ZTPMIO, ZERROR, and ZTPWAT from APLUNIX. Moved to APLGEN: an apparently generic version of ZTPOPD (VMS uses 4-byte words for record length, generic uses bytes). Moved to APLUNIX: C routines ZDACLS, ZTPCL2, and ZTPMI2 and Fortran routine ZTPWAD (which may not be generic due to use of Fortran error code). Moved to APLCSEX: C routines ZDAOPN, ZTPOP2, and ZTPWA2 (we still need APLUNIX versions of these). Also moved to APLCSEX: a version of ZTPOPN which is the generic routine plus the necessary Convex tape movement.

Moved nowhere.

4187. May 12, 1987

FITTP

Eric

Changed confusing adverb FORMAT into two, adding BLOCKING. Changed FITTP, FITTP.HLP, POPSDAT.HLP, DAPL.INC, CAPL.INC, DFTP.INC and CFTP.INC. Created BLOCKING.HLP and added it to NEWPARMS.001.

Moved nowhere.

4188. May 12, 1987

IMLOD, UVLOD, FITTP

Eric

Changed IMLOD, FITTP, UVLOD, UVERR, TAPIO, TPIOHD to use a full 48-character file name for FITS disk files. This changes the dimensions and allocation of words in FDVEC, the control array for all TAPIO. Improved handling and history recording of the disk file name. Dropped adverb referring to the disk number of the FITS disk file — it has no use. Changed includes DUIH, CUIH, DMLT, CMLT, DFTP, and CFTP.

Moved nowhere.

4189. May 12, 1987

TPHEAD

Eric

Made change to addressing in UWRITE which handles Export format files for verb TPHEAD.

Moved nowhere.

4190. May 12, 1987 WSL0D Eric
Added code back in to compress the output files — they were coming out way too large. Also moved the ZTPCLS call to close the tape when the task is done with it, rather than waiting until the task finishes.
Moved nowhere.
4191. May 12, 1987 Other tape things Eric
Changed to new FDVEC pointers:
TPHEAD FWRITE AU4 UWRITE EXPND EXIND IBMTP
PRTPP UVEXP EXPND FILLR UVERR WSL0D
Changed includes to new FDVEC dimensions:
DPTP DXPN DMC
Changed precursor comments and dummy declarations for FDVEC size:
EXTREQ MLREOF SKPEXT TABLIN VBOUT GTF3D PTF3D
R3DTAB RWTAB TABHDR
Changed call sequence to ZTPOPN
AIPMAN GRITP RDFITS GRTOTEX PRHTM AVTP BAKLD
BAKTP
Moved nowhere.
4192. May 15, 1987 TPHEAD Eric
Changed AU4 and TPHEAD.HLP to allow FITS disk files to be read by TPHEAD. Now users will not have the excuse that they don't know what's in their files.
Moved nowhere.
4193. May 15, 1987 FITS disk area Eric
Created a new disk directory area AIPS_ROOT:[FITS] for users to store their FITS disk files. Changed ASSHBASIC.COM to define the logical FITS. Changed the installation procedure ICREDIR.COM to create this directory.
Moved nowhere.
4194. May 18, 1987 DOCTXT:UGUIDE.RNO and UGUIDE.MEM Kerry
Updated the AIPS installation guide for UNIX systems to reflect the 15APR87 release.
Moved to 15JUL87 same date. This change also made it on the 15APR87 installation tape for UNIX.
4195. May 22, 1987 SOUFIL Bill
Fixed bug in logic for specifying "all sources *except* the specified list". The minus sign was not being stripped off of the source name.
Moved to 15JUL87 this date.
4196. May 23, 1987 STFUN.HLP John Simonetti/Neil
Modified discussion of error estimates.
Moved nowhere.
4197. May 25, 1987 FITTP Bill
Modified FTUVHE to add descriptive comments in the main FITS header record for the principal axis types and random parameters. This should make the conventions used in AIPS somewhat more transparent to someone trying to crack an AIPS UVFITS tape.
Moved nowhere.
4198. May 25, 1987 CGASET Bill
Cleaned up test for blanking in the determination of the delay and rate error correction factors. This problem was causing many sine argument range errors on the Convex.
Moved to 15JUL87 this date.
4199. May 26, 1987 EXTLIST Eric
Corrected AU8A to account for earlier changes in the inputs to UVPLT and VBPLT. When the inputs to plot-file-producing tasks change, corresponding changes to EXTLIST *must* be made. The UVPLT correction was simple: adding 1 to all offsets larger than 8. However, VBPLT is no longer parallel to UVPLT and requires a whole new section of code. Furthermore, VBPLT now has so many input parameters that they no longer fit in the one plot-file record reserved for them. Fixed the code to handle the new inputs and to look for this overflow. No long term fix is needed since the conversion to INTEGER*4 will remove the problem.
Moved from 15OCT87 this date, nowhere else.

4200. *May 28, 1987* CSLGET *Bill*
Work-around for Convex compiler bug. If there are nested do loops with mixed `INTEGER` type induction variables and the outer loop branches to the end before entering the inner loop, then the inner loop is entered at the end. `CSLGET` contained 2 instances of this; a separate end statement was added for the outer loop.
Moved to 15JUL87 this date, nowhere else.
4201. *May 28, 1987* CLUPDA *Bill*
Output smoothed `SH` tables were being deleted for single-source files.
Moved to 15JUL87 this date, nowhere else.
4202. *May 29, 1987* QCVMMA *Bill*
The version of this routine in `QPSAP` had a `ZVND.INC` include in spite of a dependence; this was causing an error in the gridded fringe search in `CALIB` (and `VBFIT` if it works) on the Convex. An improved version has been added to `QVEI` which avoids the dependency problem. The version in `QPSAP` has the `ZVND.INC` removed.
Moved to 15JUL87 this date, nowhere else.
4203. *May 29, 1987* CALIB *Bill*
Changed all of the integers in the `LINPACK` routines to `INTEGER` instead of `INTEGER*2`. Type mismatches were screwing up some of the least squares solutions on the Convex; on the `VAX`, `INTEGER` defaults to `INTEGER*2` so the problem doesn't occur.
Moved to 15JUL87 this date, nowhere else.
4204. *June 4, 1987* PRTAB *Phil*
Fixed the way in which `PRTAB` was generating the times when `DOHMS` was switched on. This broke on the Convex due to a `Vaxism I` had unfortunately coded in.
Moved to 15JUL87 this date, nowhere else.
4205. *June 5, 1987* CALIB *Bill*
Fixed an incorrect test in `CLBSRC` checking to see if there was and data for the reference antenna; the test was to see if the sum of all weight on that antenna exceeded 1.0, the correct value is more like 1.0E-20. Also fixed more inconsistencies in the integer types in the `LINPACK` routines and the routines calling them. Also modified `CLBSRC` to try a 1-baseline search if a multiple baseline search is done and fails.
Moved to 15JUL87 this date, nowhere else.
4206. *June 9, 1987* VBCIT *Bill*
The call to `ANTINI` did not have properly initialized arguments.
Moved to 15JUL87 this date, nowhere else.
4207. *June 9, 1987* CALIB *Bill*
The baseline weights for fringe fitting are normalized in `CLBSRC` so that the input data weights do not influence the importance of delay and rate constraints in the least squares solution. The old method caused the delay and rate constraints to dominate the solution when the amplitudes had been calibrated. Also fixed a bug in the handling of `UVRANGE`, the values were not being multiplied by 1000 as advertized.
Moved to 15JUL87 this date, nowhere else.
4208. *June 10, 1987* DGHEAD *Bill*
`VISCHT` was not being called for multiple sources. This was causing `CALIB` to create a scratch file the size of the full data set when multiple calibrators were being used.
Moved to 15JUL87 this date, nowhere else.
4209. *June 11, 1987* CALIB *Bill*
`GASOLV` was scaling rates to `sec/sec` even when the values were blanked, thus causing them to become unblanked. This was only a problem in `LISTR`; application of the solutions ignored these records because the rest of the entry was blanked.
Moved to 15JUL87 this date, nowhere else.
4210. *June 11, 1987* CALINI, SNINI *Bill*
Corrected the units for residual delay and rate in `CALINI` (they were reversed). Corrected the spelling of "INITIALIZED" in the error message generated by `SNINI` and `CALINI`.
Moved to 15JUL87 this date, nowhere else.

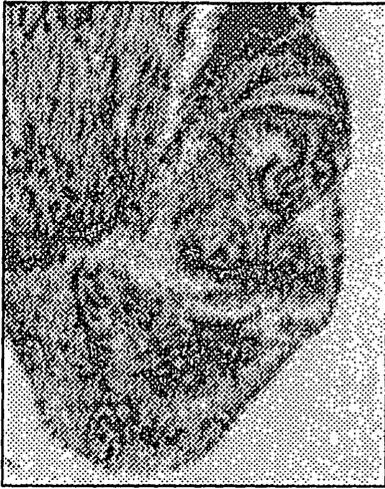
4211. June 12, 1987 VLBIN Phil
Added some more checks to ensure cross-correlation functions were not passed into AIPS. Program now prints a message every 1000 data points to let the user know something is happening. Fixed calls to TABCAL which were filling some total model columns in the CL table incorrectly. Also corrected the way in which visibilities and AC data were counted.
Moved nowhere.
4212. June 12, 1987 IRING Eric
Changed scaling of max and min to the plot routines. The old code would blow up if the image was all negative.
Moved to 15JUL87 this date, nowhere else.
4213. June 12, 1987 VMS Installation Eric
Changed ICREOPT.COM to remove the reference to the non-existent AIPVMS link library. Changed VGUIDE.REO and IBATCH.COM to add /NOPRINT/KEEP to the description of the running of IBATCH. Otherwise, about 6 Mbytes of logfile get printed. Changed VERDATE to 15OCT87 in ILOAD.COM.
Moved all but ILOAD to 15JUL87 this date, nowhere else.
4214. June 12, 1987 VMS Procs Eric
Changed AIPS.COM to allow fancy process names (with more quotes). Changed ASSLOCAL.COM to define LOCAL in a manner similar to TST and redefine LOCRUN, LOCLD, and LOCSYS in terms of it. Changed ICREDCL.COM to do the same at installation time. ASSLOCAL had the LOCAL areas on the wrong disk in C'ville as well!
Moved to 15JUL87 this date, nowhere else.
4215. June 12, 1987 IIS Model 75 Scott Allendorf/Eric
The IIS Model 75 code was not fully corrected for the new handling of the OFM via a full set of parameters. Dropped a multiply by 4 in YINIT and excess copying of arrays in YOFH.
Moved to 15JUL87 this date, nowhere else.
4216. June 12, 1987 UPDAT Scott Allendorf/Eric
UPDAT had an error in the code to translate from old to A version which would cause it to rename some files from old to B in one step. This would leave other files floundering when the translation had to be more than one step (old to A and then to B). Corrected a call to ZPHFIL into one to ZPHOLV (CHA...)
Moved to 15JUL87 this date, nowhere else.
4217. June 15, 1987 POSSM Phil
Fixed call to RCOPY which was trashing DEVTAB on the Convex (for some reason it was OK on the VAX); this was causing the program to sit and sulk.
Moved to the Convex this date.
4218. June 16, 1987 LSRVEL Phil
Renamed this adverb to SYSVEL, which is what it should be because the frame of reference is set by VELTYP. Updated CAPL.IBC, DAPL.IBC and POPSDAT.HELP to reflect this change. Also changed the inputs and help to SETJY, which is so far the only place in which it is used.
Moved nowhere.
4219. June 17, 1987 UVIMG Eric
New task: grids selected uv data into an image file using the two current sort parameters as the y and x axes, respectively. This should be the equivalent of BTMAP at the VLA. Files involved are UVIMG.FOR, UVIMG.HELP, DUVI.IBC, CUVI.IBC and GRIDTB.FOR. The latter is a separate routine for use in the interactive editing task which is under preparation.
Moved nowhere.
4220. June 18, 1987 PRECES Bill
Specified the units of RA and Dec (radians) in the precursor comments.
Moved nowhere.
4221. June 18, 1987 SQASH Eric
New task: sums or averages planes in a cube along one or more specified axes (3-7) with or without honoring blanking. The blanking option means either that an output pixel is blanked if any one input pixel to it is blanked or only if all the input pixels to it are blanked. Also a help file, of course.
Moved to the Convex this date, nowhere else.

4222. June 22, 1987 MULTI Kevin Lind
New task: Converts single-source UV data files to multi-source UV data files, creating an SU and CL table. See help file for additional details. This program is required in order to apply a priori antenna calibration to data files which have been SPLIT or have come from the CIT correlator.
Moved to the Vax only.
4223. June 22, 1987 Misc Brian Glendenning/Eric
Corrected: DAPL.INC and CAPL.INC to keep the number of continuation lines within bounds. Corrected common names to be different from subroutine names in APCLE, SDCLN, ASCAL, HX, VH, VTESS, and UTESS. Corrected misplaced parentheses in logical statements in ALGSUB (checking if data are in grid) and in SSMO (checking for non-zero amplitudes). Corrected overlong DATA statements in CALINI and GAININ by equivalencing shorter variables and DATA-ing them.
Moved corrections only to 15JUL87 this date, nowhere else.
4224. June 22, 1987 DATCAL Bill
Fixed bug in counting if any data was good. If visibilities were even partially flagged the entire record was discarded.
Moved to 15JUL87 this date, nowhere else.
4225. June 23, 1987 VBPLT Bill
For some axis types various necessary parameters were not being set, resulting in the program blowing up.
Moved to 15JUL87 this date, nowhere else.
4226. June 23, 1987 UVFIX Bill
Changed format 2007 in UVWCAL to 2F15.5 to avoid output conversion error writing history record telling the amount of the tangent point shift.
Moved to 15JUL87 this date, nowhere else.
4227. June 23, 1987 IVAS Eric
Changed: YTVCLN to give the correct character size (12 by 22), YCHRW to write the characters 3 pixels higher in Y, and YSPLIT to allow all channels to be turned off. The latter involves a call to FIVASSELIMAGE following the call to FIVASDEFIMAGE. In principle, this is superfluous, but in practice it is needed to get all planes off.
Moved to 15JUL87 this date, nowhere else.
4228. June 25, 1987 DBCON Bill
Bad call sequence to SOUINI in DBSOUR was causing DBCON to fail when concatenating multi-source uv data sets.
Moved to 15JUL87 this date, nowhere else.
4229. June 26, 1987 TASK.HLP Bill
Added calibration- and editing-related routines. Deleted a few defunct tasks.
Moved to 15JUL87 this date, nowhere else.
4230. June 26, 1987 ANCAL John
ANCAL was missing a flag and trying to calculate antenna gains for sources below the horizon. The task was blowing up with square roots of negative numbers.
Moved to 15OCT87 and 15JUL87 this date.
4231. June 29, 1987 LISTR Bill
Fixed several bugs: 'LIST' option now works for baselines for which the lower antenna number is given in BASELINE. The 'GAIN' option should not list 0 times. When multiple data types are listed with the 'MATX' option there will be less header information before the second set; this will make it easier to determine which sets belong together. OPTYPE='GAIN' should now work when a list of sources deselected is given.
Moved to 15JUL87, this date, nowhere else.
4232. July 1, 1987 UVLOD Bill
Fixed a number of problems in UVFHIS involving reading antenna info from the history cards. The Pipeline now appears to write antenna information in this fashion. The uncorrected UVLOD was choking on these tapes.
Moved to 15JUL87, this date, nowhere else.

4233. July 1, 1987 ZMCACL Bill
Corrected bug in repeat count in APLVMS and APLCVEX version. This was causing FILLR to blow up under some circumstances.
Moved to 15JUL87, this date, nowhere else.
4234. July 3, 1987 FILLR Bill
Corrected problems which caused source positions to be picked up from data in a subarray other than the one selected. This problem also caused the data not to be averaged properly when more than one subarray was on the tape. Also changed DMC.IHC.
Moved to 15JUL87, this date, nowhere else.
4235. July 3, 1987 AIPCAL.HLP Bill
This help file is the first pass at online documentation for calibrating and editing *uv* data in AIPS.
Moved to 15JUL87, this date, nowhere else.
4236. July 9, 1987 APGNOT:LWPLA.FOR Kerry
Replaced calls to non-standard intrinsic IINT with ANSI generic intrinsic INT. Also replaced a Z format specifier with an A format specifier after translating to hexadecimal CHARACTER representation (Z format specifiers are not part of the ANSI standard).
Moved to 15JUL87 same date.
4237. July 10, 1987 ASCAL Phil
ASCAL died if the input data set had an IF axis, since the extension type held in the map header common was blanked out before being accessed to look for CH tables. Fixed.
Moved to 15JUL87, this date, nowhere else.
4238. July 10, 1987 VSCAL Phil/Fred
Fixed same problem as was in ASCAL. In addition, the call sequences to the least-squares gain solution routines were totally screwed up. Fixed.
Moved to 15JUL87, this date, nowhere else.
4239. July 14, 1987 SLICE Neil
The image header scale and offset factors were not being applied when reading floating point images.
Moved to 15JUL87 this date, nowhere else.
4240. July 15, 1987 PRTAB Phil
PRTAB was not recognising values in tables which were blanked. It now prints the word 'IHDE' when encountering one.
Moved to 15JUL87 this date, nowhere else.
4241. July 15, 1987 CALIB Phil
There was a type mis-declaration in subroutine SEVAL which was causing the SNR's to be calculated wrongly; fixed.
Moved to 15JUL87 this date, nowhere else.
4242. July 16, 1987 TVFLG Eric
New task to do interactive editing of *uv* data using the TV. It has a variety of image computation, load, enhancement and flagging options. The master file it creates may be catalogued and the task restarted. Also a help file (with some Explain sections) and DTVF.IHC and CTVF.IHC. Also changed:
GRIDTB — Added another mode to grid real and imaginary separately. Corrected time units and saving header to catalog.
UVING — Added test on DPARM(1) in the range 0-2 to keep it from invoking the new mode in GRIDTB. Corrected time units and saving header to catalog. Also changed the help file.
Moved from Convex where it was developed, nowhere else.

4243. July 16, 1987 Y routines Eric
Changed:
YCURSE — (YM70) The zoom correction seemed not to be quite right yet again (has something changed?). Corrected output by 1.0/MAG pixels.
YCUCOR — (YM70) Made the corresponding changes.
YFILL — (YIVAS) Corrected call sequence to FIVASHAINAGE. TVFLG must be the first task to use YFILL on grey planes.
IHANOT — Changed the border to scale with TV size.
YIHIT — (YIVAS) Drawing the cursor in the usual way with FIVASCSLINE seems to hit timing problems, so I changed to use FIVASCSSHAPE to draw IVAS's idea of a plus sign.
Moved to 15JUL87 this date except IHANOT and YIHIT.
4244. July 17, 1987 ANCAL.HLP Phil
Inserted warning in the ANCAL HELP file concerning the use of the E-format in the calibration text file. The keyin routines cannot yet cope with this.
Moved to 15JUL87 this date, nowhere else.
4245. July 17, 1987 VBFIT Phil
Changed all of the integers in the LINPACK routines to INTEGER instead of INTEGER*2. Type mismatches were screwing up some of the least squares solutions on the Convex. Also fixed several small bugs which were causing problems on the Convex (I*2 again)
Moved to 15JUL87 this date, nowhere else.
4246. July 17, 1987 VSCAL Phil
Changed all of the integers in the LINPACK routines to INTEGER instead of INTEGER*2. Type mismatches were screwing up some of the least squares solutions on the Convex.
Moved to 15JUL87 this date, nowhere else.
4247. July 17, 1987 SPLIT Phil
SPLIT was not updating the frequency increment (bandwidth) in the catalogue header when averaging in frequency was requested. Fixed.
Moved nowhere.
4248. July 22, 1987 POSSM Phil
Added ability to print the antenna names on the plot-file. Program also now tells user the version number of the plot-file produced.
Moved nowhere.
4249. July 23, 1987 PUV.D.INC Bill
Changed number of active flags allowed to 1000. This required recompiling and linking all routines which use this include.
Moved nowhere.
4250. July 23, 1987 VLBIN Phil
Could not cope with autocorrelation VLBI line data which came from a MkIII correlator due to a minor format difference. Fixed. Also a few minor changes in statements so the program can compile on a Sun.
Moved nowhere.

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July 15, 1987



AIPS LETTER
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A I P S L E T T E R

Volume VII, Number 4: October 15, 1987

National Radio Astronomy Observatory

A newsletter for users of the
Astronomical Image Processing System

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TeXset by EWG

We Need Your Help

Several items were raised at the *AIPS* Workshop (see the report in this *AIPSLETTER*) that suggest “action items” for *AIPS* managers generally. We would like your input on the following:

1. Have you experienced difficulties with running *AIPS* from user accounts, or with security breaches resulting from the passwordless *AIPS* accounts? Do you feel that something “standard” should be done about this, and if so, what? Please send explicit suggestions and reports of problems to Eric Greisen.
2. Are there explicit enhancements you would like to see in *AIPS* graphics? Are there graphics packages to which you would wish to see “standard” interfaces, and if so, why to these packages rather than others? Please send your ideas to Eric, or to BANANAS.
3. An *AIPS* Managers’ training and trouble-shooting manual is needed. Just as the *COOKBOOK* was written (initially) by users, the Managers’ manual should be written (initially) by managers. Please send your suggestions about what should be covered, and (even better) your local collection of tips, tricks, and recurrent bug fixes, to Don Wells. He and Laura Carriere of the University of Toronto have offered to compile your ideas into a manual.

15JAN88 Release is Cancelled and a Personal Note

At about 11:30 a.m. on 12 October, a fire in Kerry Hildrup’s house destroyed almost all of his possessions. Most items which were not burned suffered heavy smoke damage. For several weeks Kerry was preoccupied with recovering such items from his house, and with itemizing his losses for insurance purposes. As a result, the 15OCT87 freeze-date was delayed, and therefore this *AIPSLETTER* has been delayed.

Because of the long delays and heavy demands on the time of the *AIPS* group, we have decided to cancel the 15JAN88 release. The 15APR88 release should appear as scheduled.

Summary of Changes: 15 July — 15 October 1987

These changes are listed in detail in the `CHANGE.DOC` files reproduced later in the *AIPSCLETTER*. There are 335 entries listed this quarter. Four major projects have reached fruition this quarter — interactive *uv* editing (`TVFLG`), polarization calibration (`PCAL`), bandpass calibration (`BPASS`), and a more generic and consistent Z-routine package. All, except `BPASS`, appear in the 15OCT87 release. The VMS Z routines have not been revised as yet to fit into the new Z routine structure, but, since call sequences have not changed, the entire package continues to work.

Changes of Interest to Users: 15OCT87 as NEW

A new task has been implemented for determining instrumental polarization (`PCAL`) and the standard calibration routines have been modified to include this correction (see entry #s 4252 and 4256). Provisions have been made in the package for a rigorous solution for the effective ellipticity and orientation of the feeds, but, at present, only a much quicker, linear approximation, similar to that done at the VLA, has been released. `TVFLG`, the interactive *uv* editor, has been improved to offer several new flagging modes including interactive clipping and to handle multiple sources, IFs, and channels properly (see entry #s 4416, 4429, and 4438). `CALCODE` and `QUAL` are now implemented in the selection of sources or calibrators in some tasks (entry # 4271). A wide variety of lesser improvements and corrections were made to the table and calibration tasks. Among these were the addition of a print option for bad closure errors in `CALIB` (# 4255), changing `POSSM` to plot bandpass tables (# 4365), cleaning up `MULTI` (# 4281), and adding clarifications to numerous help files.

A serious error was discovered in the writing of bit arrays to tape in `FITTP`. Flagging tables will not be properly recovered as a result; see # 4300 for details. Potential problems with FITS ASCII tables were also corrected (# 4312).

Changes of Interest to Users: 15JAN88 as TST

`BPASS` is a new task to generate the BP tables which can be used to correct spectral line format data for the complex response of the bandpass function. The program has two modes: (1) it can perform a least-squares decomposition of the visibility data of a calibrated continuum source in order to determine the antenna-based complex bandpass functions, or (2) it will pass autocorrelation data directly to the BP tables (these BP entries will of course have no phase information). The BP tables can then be applied to multi-source data sets by using the `DOBAND` option. See entry #s 4484, 4481, and 4395.

`IM2UV` is a new task to FFT an image and convert the result to a *uv* data file (entry # 4452). The result can then be combined with interferometer visibility data and/or edited and/or retransformed to the image plane with `UVMAP` or `MX`. This task was requested to remove ripples from the background of IRAS images, but obviously has many other potential uses.

Among the other improvements are new options in `CLCOR` to correct for clock drifts at a telescope (# 4340), to remove (or to add) the phase of the parallactic angle (# 4403), and to correct for gross pointing errors (# 4418). Clean components files containing extended components (optically thin uniform spheres or Gaussians) are now supported by a number of *AIPS* tasks including `UVSUB` and `CALIB` (entry #s 4431 and 4432). The table editing task `TABED` now supports standard *AIPS* wild-card conventions in character strings and can perform numeric conditioning tests on all possible entries (# 4405). A new, more portable version of `MOMNT` was submitted by Scott Stevens and Neil Killeen (# 4476).

The *AIPS* routines for handling single-dish data were improved during the quarter. The pseudo-*uv* data headers were changed to tell the truth about the data (#s 4426, 4450, 4451, 4458). The gridding tasks were revised to support the full range of *AIPS* projective geometries and the concept of IFs (# 4461). *AIPS* can now also read single-dish FITS tapes to acquire the data (#s 4462, 4464, 4469).

Changes of Interest to Programmers: 15OCT87 as NEW

Programmers interested in *AIPS* Z routines and system support procedures will find a large number of changes in this release. Most of the changes have been made to the generic and UNIX areas, leaving VMS alone (for the moment). The call sequences to the top layer of Z routines have not changed in general, so no changes are required to implementations other than UNIX or to non-Z routines. See the following article and entries 4489 and beyond for more information.

Installers of *AIPS* will note that VMS tapes no longer contain the pseudo-AP load modules if they have been written at 1600 bpi (see # 4335). This was required to keep the shipment down to two tapes — we really do recommend ordering 6250-bpi tapes where possible. Installers of *AIPS* on “non-standard” computers will benefit from improved versions of EXPFIT and IMPFIT (# 4336). And anyone wishing to test his or her *AIPS* installation will find an improved version of the DDT package in this release (# 4337). There are two new Z routines, but generic forms are available (#4300).

There appears to be some problem with IVAS TVs in regard to the positioning of the cursor. Some corrections appear to be necessary for the one in Charlottesville, but there is evidence that the same corrections may not be needed elsewhere. If you have an IVAS, check # 4334 and the performance of your TV closely and let us know how it works.

Programmers using the calibration package should note the addition of polarization calibration options (# 4252), support for CALCODE and QUAL in source selection (# 4271), and the change to the call sequence of FLAGUP (# 4318).

Changes of Interest to Programmers: 15JAN88 as TST

Very few of the changes to 15JAN88 will have a significant impact on programmers. Users of the calibration package will note changes to support bandpass calibration (# 4481) and to describe the coordinates in the *uv* domain more accurately (#s 4450, 4451, 4458).

System and UNIX Changes

The 15OCT87 release includes the first installment of the so-called generic Z-routines which are stored in the APLGEN area. The routines in this area are designed to be either functionally generic to a wide range of systems (if not all systems) or “stubbed” in the case of those routines that are invariably implementation-dependent. The stubbed routines issue error messages to that effect and either return a suitable error code or STOP the program. These will require development for implementations of *AIPS* under systems not already supported by NRAO. All the APLGEN area routines should at least be complete in terms of documentation of their purpose (*e.g.*, ZMCACL and ZRDMF), and in some cases, they may even be complete to the point of being functional except that some system-specific value may need to be substituted (*e.g.*, ZTPWAD). In future releases, still others may be provided that are “conditionally” generic. These may branch to code appropriate to the host based on system constants such as floating-point format codes or may be functionally generic only to those systems where 16-bit integers are supported, but otherwise stubbed. The ultimate goal is to distill our accumulated experience under a variety of operating systems into a consistently documented, modular set of 150-200 Z-routines. These will then serve as the canonical system interface design for *AIPS* in much the same way this has largely been done for the Q-routines and Y-routines.

The present set of routines found in the APLGEN area is rather incomplete (roughly a quarter of the anticipated number). At some point, the APLGEN area should be populated with the entire set. For the

moment, apart from the new routines ZX8XL and ZXLX8, the VMS implementation does not make use of any of the routines in the APLGEN area. VMS-specific versions of all the other APLGEN routines (*i.e.*, those that are presently required for the VMS implementation) exist in the APLVMS area. On the other hand, the current set of APLGEN routines are heavily used by the UNIX implementation. UNIX sites with previous releases of *ATPS* will note that a number of Z-routines such as ZEXIST, ZCREAT, ZOPEN, ZCLOSE, ZDESTR, etc. no longer exist in any of the UNIX Z-routine directories. Instead, the APLGEN versions of these routines are used for UNIX much like the COS and VMS implementations ultimately will. The restructuring of the Z-routine design has entailed a modest amount of additional "layering" or isolation of functionality. Whereas this increases the total number of routines required for a given implementation, the number of these routines that need to be system specific has been substantially reduced. For example, the effect for the UNIX implementation is that the number of UNIX-specific Z-routines has been reduced by about one third from the 15JUL87 release. A further reduction in the number of UNIX-specific routines to about one half of those in the 15JUL87 release appears likely. Once the APLGEN routines have been incorporated into the VMS and COS implementations, the number of required routines specific to VMS and COS should be similarly reduced. The effort for the VMS implementation will probably take place as part of the planned code conversion. The effort for the COS implementation is in progress as part of our installation of *ATPS* at the Pittsburgh Supercomputer Center.

It should be emphasized that in the 15OCT87 release, none of the Z-routines called directly by applications code have changed in name or calling sequence. These developments will therefore *not* require any modifications to local programs and they should be totally transparent to the installer. It is also not expected that many such changes will be made in future releases, which means that further efforts to rationalize the *ATPS* Z-routine design should be similarly painless. Many of the APLGEN routines do, however, depend on the new INCLUDE file, ZDCH.INC, which is used to declare and define some required system parameters in the common /ZDCHCM/. Since the APLGEN routines are only used by the UNIX implementation at the moment, these system parameters are only of interest to UNIX sites. Several of these parameters are new and must be assigned host or configuration-dependent values in the routine ZDCHIN as part of the installation process. The remaining parameters involve the design of the host file table (*i.e.*, FTAB array) entries. Some of these were formerly declared and initialized as local variables in various I/O-oriented Z-routines which tightly coupled these routines to the host file table design. Others have been added to make it possible to develop generic versions of these higher-level, I/O-oriented Z-routines while preserving flexibility in the file table design. The initialization of all such file table-oriented parameters is now centralized in the routine ZDCHIN (see ZDCHIN for UNIX Systems). These parameters should only require modification as part of implementing *ATPS* under an operating system not already supported by NRAO and even this is probably unnecessary.

In addition to the use of the APLGEN routines, the 15OCT87 release also includes a rather major overhaul of the routines found in the UNIX-specific Z-routine directories. The new C routine, ZDCHI2, as called by ZDCHIN, is central to many of these changes (see ZDCHI2 for UNIX Systems). Its purpose is largely two fold. First, it is used to determine, in a machine-independent fashion, many of the values for the variables in the device characteristics common (*i.e.*, /DCHCOM/). These "system constants" were formerly provided by means of hard-coded assignment statements in ZDCHIN. ZDCHI2 eliminates this potential source of installation error, however, there are several that *must* still be assigned manually (*i.e.*, BYTFLP and NWDPLO) as well as some new ones that also *must* be assigned manually (*i.e.*, SPFRMT, DPFRTM and NVOLSC). Secondly, ZDCHI2 provides a means by which these centrally-defined system constants can be made available to other C routines as external variables. It also calculates a variety of other useful system constants which are also made available to other C routines. These system constants have been used to make the UNIX Z-routines highly generic regardless of host word size.

File locking has been introduced in the UNIX implementation for the 15OCT87 release. The locking mechanism is not implemented for text files since text file I/O is performed using Fortran logical unit numbers and UNIX file locking is limited to C file descriptors. The Berkeley and Bell UNIX file locking

techniques are substantially different and we have no in-house implementation of *AIPS* on a Bell UNIX system. So, whereas the implementation for Berkeley UNIX systems has been well tested, the implementation for Bell UNIX systems should be regarded only as a starting point for local development. In particular, the implementation of file locking for Bell UNIX systems is based on the System V 2.0 mechanism which only allows "exclusive" locks. This will not suffice for *AIPS* since multiple opens are often performed on the same file. The documentation suggests that the notion of "shared" locks is supported under System V 2.0+, but we do not have the resources to experiment with this at NRAO. In any case, UNIX file locking mechanisms are currently only cooperative, not mandatory (see File Locking for UNIX).

The lengths of Fortran CHARACTER arguments as passed to routines written in C are now passed explicitly in many of the Z-routines. Ultimately, all such routines will be converted to this technique. These lengths are normally "extra" arguments passed as part of the Fortran/C procedure interface on UNIX systems. Unfortunately, there is no standard for their position in the argument list (as we painfully discovered on Alliant systems). Passing these lengths explicitly has reduced the number of Alliant-specific Z-routines substantially (from 34 to 13) with room for further reduction.

As part of the effort to establish a generic set of Z-routines for all systems, the names of many of the lower-level routines have also been changed to something more generic. In previous releases, some lower-level routines had names of the form ZQ*, a reference to VMS QIO. Others had names of the form ZX*, which implied routines that were required by the UNIX implementation, but otherwise had no counterpart in say, the VMS implementation. A more generic naming convention has been adopted, whereby lower-level routines have names similar to the names of the higher-level routines that call them. For example, ZEXIST now calls ZEXIS2, which was formerly known as ZXXIST, and ZRENAM now calls ZRENA2, which was formerly known as ZQRENA. Several routines still have the old-fashioned names (*e.g.*, ZQTRUN, ZXTSPY), but will be renamed to comply with the new convention as time permits. It should be noted that the routines that have been renamed in the 15OCT87 release also include those routines which almost invariably require local development. Therefore, any extant local versions of these from previous installations will have to be similarly renamed in order to be compatible with the calling routines of the 15OCT87 release. In particular, these include ZXMOUN which is now known as ZMOUN2, ZQTAPE which is now known as ZTAP2, ZXTPIO which is now known as ZTPMI2, ZXFRE2 which is now known as ZFRE2, and ZXLPR2 which is now known as ZLPCL2. Calls to ZXTLOG are also being replaced by calls to ZTRLOG everywhere, but this process has not been completed in the 15OCT87 release. Therefore, the routine ZXTLOG must still exist. The routine ZQASSN, which was formerly called to handle the actual opening of Tektronix-like, as well as tape and TV, devices, has been replaced by the routines ZTKOP2, ZTPOP2 and, for example, ZM7002 for these respective device types.

Finally, the calling sequences of several lower-level routines have been changed. These include ZEXIS2 which was formerly known as ZXXIST, ZCREA2 which was formerly known as ZQCREA, ZM70M2 which now has an error return argument, ZM70X2 which was formerly known as ZTVQIO, ZQMSCL which now has an argument for the length of the file name being passed, ZTXMA2 which was formerly known as ZPARS, ZTKFI2 which was formerly known as ZTKQIO, ZPRI2 which was formerly known as ZPRI02 and ZFRE2 which was formerly known as ZXFRE2. Most of these involve highly generic routines and any change in calling sequence should cause no concern. However, the difference between the calling sequences of ZFRE2 and its predecessor ZXFRE2 should be noted since this routine usually needs to be developed locally.

1987 *AIPS* Workshop

The 1987 *AIPS* Workshop was held in Green Bank on Tuesday, September 15 and Wednesday, September 16. There were 34 "official participants," and several Green Bank staff and visiting observers came to some of the sessions. The participants were mainly *AIPS* site managers and programmers. The groups that were represented were CSIRO Radiophysics, Fujitsu (Nobeyama Observatory), Max-Planck-Institut für Radioastronomie, ESO, Jodrell Bank, Herzberg Institute (DRAO and Ottawa), University of Toronto, University of New Mexico, Haystack Observatory, NRL, Goddard Space Flight Center, STScI and the COBE Project. The intimate nature of the Green Bank facilities, with the auditorium, Residence Hall, cafeteria and lounge being close together on-site, greatly helped the participants to get to know one another and to exchange ideas and concerns about *AIPS*.

AIPS Memo No. 53 contains a summary of the workshop distilled from Alan Bridle's notes, and we encourage you to request this memo by slow mail using the *AIPS* Order Form or electronically from AIPSSERV as DOCTXT:MEM053.MEM (see the item in the *AIPSLATTER* describing how to use AIPSSERV if you have not already introduced yourself to this new service).

The main items discussed were:

- Use of *AIPS* for non-radio applications, and the need for further coordinate systems and other enhancements to support the COBE project.
- The new continuum calibration package, including the need for an improved terminal interface, *e.g.*, to support multi-page inputs in tasks such as CALIB, and for the polarization calibration code to support Faraday rotation corrections.
- The new spectral line calibration package, including its ability to diagnose antenna-based corrections that have hitherto been undetected at the VLA, and plans for supporting special needs of VLBI spectral line data reduction.
- The impact of the new VLA on-line system on *AIPS* data reduction.
- *AIPS* in the Fujitsu supercomputers at Nobeyama, and in the 4-headed Alliant at Jodrell Bank.
- *AIPS* displays in networked workstations and "TV-by-wire."
- The need for a more efficient *AIPS* procedure to do OLAF-style "difference mapping."
- The large body of *AIPS* code and modifications developed at CSIRO, and its capabilities.
- The need for interfaces to standard graphics packages, and for ASCII and DIF export of *AIPS* tables so that they can be examined and modified (for example) by PC spreadsheet and database programs.
- The need for "standard" tools to run *AIPS* from individual user directories and accounts (many sites have tools for this already), even for this to be the norm not the exception. Password protection for *AIPS* was also discussed.
- Special needs of VLBI data reduction.
- *AIPS* in the SUN workstation environment (several extensive discussions).
- The future of *AIPS* in workstations generally (bright, and enthusiastically embraced by several *AIPS* sites, as well as in the NRAO's future plans).
- The proposed "code overhaul", its benefits and impact on sites, including the lack of an UPDATE task to go with it, and ways to work around this by keeping an old FITTP alive.
- The Z-routine overhaul that is already under way.
- The advantages of preprocessors.

- The “future of *AIPS*” — reviews and discussions of new technology, including minisupercomputers, workstations and archival media, and of the new NRAO array telescope computer plan.
- The *AIPS* update cycle (concluding with the reasons for keeping it as it is).
- The need for an *AIPS* Manager's training and trouble-shooting manual, and for more detailed explanation of what the installation actually does.
- Further additions to the *AIPS* Wishlist (outlined in Memo 53).

There was support for continuing to hold the *AIPS* Workshops at two-year intervals, and in Green Bank. The *AIPS* group thanks the Green Bank staff for their excellent support of this Workshop, particularly Becky Warner and Richard Fleming for their work on the local arrangements, and Mark Clark for arranging a tour of the telescopes (which stimulated discussion of *AIPS* use for single-dish data reduction!).

AIPS User's Group Column

1987 Site Survey

It is time for the the annual *AIPS* Site Survey, and Contact Persons at each site should have already received and returned the now-familiar questionnaires. There are several reasons for repeating the Survey annually. Last year's survey revealed an 83% annual growth in the number of active *AIPS* machines, and a 117% growth in the total *AIPS* machine power worldwide. These growth rates have strongly influenced the NRAO's plans for *AIPS* development and for array telescope computing, as you can see by reading the new NRAO “Array Telescope Computing Plan.” Furthermore, the demography of the growth showed that U.S. university sites are falling behind those in other countries. The NRAO has emphasized this to the NSF, in the hope that this will assist U.S. sites in obtaining NSF support. The growing size and scope of the *AIPS* community are also of interest to computer and peripheral manufacturers. As we document the growth of the *AIPS* community, we increase the likelihood that manufacturers will take our interests into account when designing new products, or offer discounts on new equipment in order to “break in” to our market. Finally, the survey data provide important background to the *AIPS* group itself as it sets priorities. There is always much more to do than can be done, and we try to target areas that have the greatest impact on the *AIPS* community as a whole, rather than purely local interests.

The Survey data are valuable in all of these areas, so it is important that we repeat it often enough that the database reflects the current situation fairly accurately. We therefore urge those of you who are Contact Persons to return the Site Survey forms fully and promptly when you get them. Be warned — we will be more active this year in harassing sites that do not reply!

A File Server for *AIPS*

Early in September, a file server called AIPSSERV was activated on host CVAX. The main motivation for this facility is to support the operations of the AIPS Group at remote sites, especially at Supercomputer Centers. The code for the “Midnight Job” which updates remote *AIPS* installations every night has been enhanced to use BITNET to communicate with the server. AIPSSERV is also available for use by *AIPS* users to fetch files from CVAX. If this application interests you, try sending an E-mail message containing the single word “help” to one of the following addresses: aipsserv@nrao.arpa, aipsserv@nrao.bitnet, ...!uunet!nrao1!aipsserv or 6654::aipsserv. A message containing the line `sendplain doctxt:memo53.mem` will fetch Alan Bridle's recent *AIPS* Memo on the Green Bank Workshop.

Internet Address Change

We expect that NRAO's Internet connections will be changed by the time you read this *AIPSETTTER*. The old name "nrao.arpa" is expected to remain valid, but only as an alias; the new official name is expected to be "nrao.edu". The new Internet numeric address will be [192.033.115.2]. At this time it appears that the changeover will occur early in December.

The Portability Column

FITS Developments

By the time you read this, Don will probably have already activated another E-mail exploder analogous to BANANAS. This one will be called "info-fits@nrao.arpa" and will be concerned with the coordination of the further evolution of the FITS Standard. In particular, we expect that a proposed floating-point format, notations for non-linear world coordinates, and a hierarchical naming convention will be discussed in the near future. Inquiries about Info-Fits should be addressed to Don at: dwells@nrao.arpa, dwells@nrao.bitnet, ...!uunet!nrao!dwells or 6654::dwells.

Product Reviews

Another New Vector/Concurrent Computer: Celerity recently announced its new "Departmental Supercomputer", which is called the Celerity 6000. NRAO has not yet had a formal presentation by Celerity; the following specifications are taken from a Celerity sales brochure. The system can have from 1 to 4 processors, each of which executes at up to 40 MIPS (25 nsec clock) and up to 40 MFLOPS, for an aggregate total of up to 160 MIPS and 160 MFLOPS. Memory sizes range up to 1 GB and I/O is up to 90 MB/s. The operating system is Unix. The brochure does not indicate whether the Fortran compiler supports the multiple CPUs. List prices start at \$235K. (Celerity, 9692 Via Excelencia, San Diego, CA 92126, 619-271-9940) *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.*

New NRAO Array Telescope Computer Plan

The NRAO has prepared a new "Array Telescope Computing Plan" that was submitted to the NSF in September 1987. This plan proposes a four-fold solution to the array telescope computing needs (VLA and VLBA). The four elements of the plan are (a) the installation at the NRAO of an image processing facility made up of a four second-generation minisupercomputers linked to a variety of workstations, (b) increased NRAO technical support for computing at its users' home institutions, (c) increased access to supercomputer centers for array telescope data processing and (d) increased software and algorithm development and optimization at the NRAO. The plan is intended to take effect in 1989, when NRAO would begin procurement of the minisupercomputers and begin hiring staff to support (a), (b) and (d). The plan has significant ramifications for the future of *AIPS* and of the *AIPS* group, and is likely to be of interest to many readers of the *AIPSETTTER*.

Copies of the plan may be obtained by request to the NRAO Computer Division either at the VLA or in Charlottesville.

Single Dish in *AIPS*

For several years, *AIPS* has had the capability to process and grid randomly sampled sky brightness measurements (tasks SELSD, GRIDR, and PRTSD). At present, this type of data uses a kludged version of the *uv* data format where 'U' and 'V' are really RA and Dec. This package has been used primarily by Jim Condon for his 300-foot telescope, 21-cm continuum survey.

It has become clear that this capability is useful for other instruments as well as single-dish radio telescopes, so Bill has been trying to clean up how this type of data is handled in *AIPS*. The most important step is to label the data correctly. As a first step, Bill has drafted a section for the *AIPS* programmer's manual, *Going AIPS*, describing a proposed FITS format for the data.

The main purpose of this exercise is to define the form of the data inside of *AIPS* that will be processed by the gridding routine, since the *AIPS* internal form is a simple translation of the FITS form. Much of the NRAO-generated single-dish data will probably enter *AIPS* in the form of tables and later be converted into the form described here. Converting to the *uv*-data-like format allows using *AIPS* utility routines for the sorting, merging, editing etc. of visibility data.

Please send any comments to Bill Cotton as soon as possible. The draft of the new sections of *Going AIPS* follows:

14.0.1 Single-Dish Data

Observations made with filled aperture instruments are frequently made at essentially random positions on the sky, possibly using a number of offset feeds or detectors. This type of data may be described conveniently using the random groups ("UV FITS") format. The FITS form of this data is the same as that of visibility data except that the number and meaning of the random parameters are different. The celestial coordinates may be either Right Ascension and Declination or projected coordinates about a specified tangent point.

A logical record consists of all data recorded from a given beam on the sky at a given time. A dummy AN table is optional.

14.0.1.1 Single Dish Random Parameters — The single dish random parameter types (PTYPE n) are described in the following:

- 'RA' and 'DEC': These random parameters are the Right Ascension and Declination of the observation in degrees. If the coordinates have been projected onto the tangent plane then the RA and Declination types become 'RA---xxx' and 'DEC--xxx' where xxx is the projection code. See the chapter on *AIPS* catalog headers and/or *AIPS* Memos 27 and 46 for details of the projection codes. These random parameters are required, but the order is arbitrary.
- 'DATE': The time tags for the data are kept in the form of Julian date in days. This random parameter is required, but the order is optional.
- 'BEAM': This random parameter gives the beam number plus 256. This random parameter is optional. The beam offset makes the data look more like *uv* data and more of the *AIPS uv*-data tasks will work for this data.
- 'SCAN': This random parameter gives the scan number. This random parameter is optional.
- 'SAMPLE': This random parameter gives the sample number in the scan. This random parameter is optional.

14.0.1.2 Single Dish Regular Axis Coordinates — The units of the regular axis coordinates are defined by convention; the conventions used by *AIPS* for the regular axis types (CTYPE*n*) are the following:

- 'COMPLEX': the complex axis consists of the real, imaginary and (optional) weight. Magic value blanking is supported. The imaginary part may be used to carry any baseline values which have been subtracted. This axis is required.
- 'STOKES': this axis is used to describe which Stokes parameters are given; the conventions are the same as used internally in *AIPS*. These conventions are discussed in the chapter on disk I/O. This axis is required.
- 'FREQ': the frequency axis coordinates are in Hz. This axis is required.
- 'IF': The IF axis is a construct which allows irregularly spaced groups of frequency channels. The IF number specifies an entry in the ('AIPS CH') table which must follow the data if this axis is present. This table gives the offsets from the reference frequency specified by the FREQ axis. This axis is optional, but if it is present then a CH table must be present.
- 'RA' and 'DEC': the celestial coordinates are given in degrees. The values associated with these axes are irrelevant (although they should be present) for unprojected data. For data with projected coordinates, the coordinate values of these axes should be the tangent point, *i.e.*, the position on the sky at which the plane onto which the coordinates are projected is tangent to the celestial sphere and these axes should become 'RA---*ccc*' and 'DEC--*ccc*' where *ccc* is the projection code. These axes are required.

Weights and flagging are handled the same as for visibility data. Sort order is the same as for visibility data except that the sort codes for sorting by *u* and *v* become:

U	ordered by RA
V	ordered by Declination
X	descending ABS (RA)
Y	descending ABS (Declination)
Z	ascending ABS (RA)
M	ascending ABS (Declination)

AIPS Publications

The Order Form at the end of this *AIPSLATTER* may be used to order the following memoranda and books. All previous memoranda are also available. Both volumes of the new edition of *GOING AIPS* are now available. If you have already ordered this new edition, please do not repeat your order.

AIPS Memo No. 53: "The 1987 *AIPS* Workshop," Alan H. Bridle, October 1987.

This memorandum is intended to capture the main points that were brought out at the *AIPS* Workshop held in Green Bank on Tuesday, September 15 and Wednesday, September 16, 1987. There were 34 "official" participants from Australia (CSIRO), Japan (Fujitsu), Italy (Bologna), Germany (Max Plank and ESO), England (Jodrell Bank), Canada (DRAO, Ottawa, Toronto), and the United States. The seven sessions covered new applications, experiences at user sites, workstations (especially SUN displays), planned and possible changes to software, new directions in hardware, and everyone's pet Wishlist items.

CHANGE.DOC: 15OCT87 Version as NEW

- 4251.** *July 24, 1987* PRTAB Phil
Could not recognize BP tables and so ignored the DOHMS option when printing time-like columns. Fixed.
Moved nowhere.
- 4252.** *August 3, 1987* Polarization calibration Bill/Fred
A new task has been implemented for determining instrumental polarization (PCAL) and the standard calibration routines have been modified to include this correction. New and affected routines and files are:
PCAL — New task: determines effective feed polarization parameters and calibrator polarizations. Feed solutions are stored in the Antenna (AN) table. Eventually two methods will be available: (1) a quick and dirty linear approximation which will allow correction of RL and LR correlations as is now done on the VLA Dec-10; and (2) a more rigorous (and expensive) solution for the effective ellipticity and orientation of the feeds. At present, only the first of these is implemented. Also: PCAL.HLP, DPCL.INC and CPCL.INC.
CALIBRAT.HLP — was modified to include a discussion of polarization calibration with a detailed recipe for calibrating VLA data.
POLSET, DATPOL — these new routines calculate to correction matrices to be applied to the data and then apply them. The correction arrays and other information are kept in a common defined in the the D/CSEL.INC includes.
CGEDI, CGEFA, CAXPY, CSCAL, CSWAP, ICAMAX — are LINPACK routines called by POLSET to invert a complex matrix.
PARANG — this new routine computes parallactic angles from information obtained by GETANT and SETSOU and left in the D/CSOU.INC and D/CANS.INC commons.
CSLGET, CGASET, DSEL.INC and CSEL.INC — were modified to use only calibration table entries for the source currently being calibrated if available. Previously, values were being interpolated between any entries. This was causing some phase calibration problems for widely separated sources; very accurate phase calibration is needed for polarization calibration to work correctly.
GETANT, DANS.INC, CANS.INC, UVGET and DATGET — were modified to allow application of polarization correction in the standard calibration routines.
LISTR and SPLIT — were modified to apply polarization corrections. LISTR was modified to allow listing the antenna parallactic angles at the times of calibration table entries. Also modified: LISTR.HLP, DLST.INC, CLST.INC and SPLIT.HLP.
CLCOR — had an option added to correct phase differences between the right- and left-hand polarization systems in both the CL and AN tables. This latter is necessary because the feed polarization parameters are a function of the phase difference between the right and left hand systems. Also modified: CLCOR.HLP and DCLC.INC to allow more history records.
Moved from 15JAN88 this date, nowhere else.
- 4253.** *August 4, 1987* PRTAN Bill
Modified to give sensible listings of any feed polarization parameter information.
Moved from 15JAN88 this date.
- 4254.** *August 4, 1987* PCAL Bill
Modified to allow specifying BIF and EIF; also shortened the listing of feed parameters and will now deal properly with all of the data in an IF being flagged. Also changed: PCAL.HLP D/CPCL.INC.
Moved from 15JAN88 this date.
- 4255.** *August 6, 1987* CALIB Bill
Added option to print closure errors in excess of given limits. Corrected logic determining the amount of oversampling that could be done in the coarse fringe fitting based on the amount of memory available. Also changed CALIB.HLP.
Moved from 15JAN88 this date.
- 4256.** *August 6, 1987* Polarization adverbs Bill
Added the adverbs DOPOL and PMODEL for use in polarization calibration. DOPOL determines if polarization corrections are to be applied and PMODEL contains a polarized point source model. Affected files: POPSDAT.HLP, DOPOL.HLP, PMODEL.HLP, D/CAPL.INC, RUNSYS:NEWPARMS.001. This change requires that POPSGN be rerun and AIPS recompiled and linked. Also corrected typos in PCAL.HLP.
Moved from 15JAN88 this date.
- 4257.** *August 6, 1987* CALIBRAT.HLP Bill
Added a description of the closure error listing option in CALIB.
Moved from 15JAN88 this date.

4258. August 7, 1987 OTBSRT Bill
Modified to suppress call to CATIO unless output version number is higher than input version number. This was causing problems for in-place sorts in the calibration routines. The catalogue header only needs to be updated if a new table was created.
Moved from 15JAN88 this date.
4259. August 7, 1987 DOPOL flag Bill
The following routines now have the value of the polarization correction flag DOPOL set to false:
CALIB BLCAL PCAL TVFLG
Moved from 15JAN88 this date.
4260. August 7, 1987 ANCAL John
The system temperature interpolation in GETSYS was being done backwards. That is, the T_{sys} value at time $t - t_2$ was being entered into the CL table rather than the T_{sys} at $t - t_1$. This error is present in ANCAL only. Previous versions of VBANT did not have this problem.
Moved to 15OCT87 and 15JAN88 this date.
4262. August 10, 1987 CONV2 Bill
Fixed bug in disk-based handling of first and last columns; the wrong array was being multiplied by the convolving function. Affected tasks are CONVL and VM. Also corrected the header comments and changed to flush the output buffer before writing the first column to disk.
Moved from 15JAN88 this date.
4263. August 10, 1987 QVEX:QMAXMI Bill
The QPSAP version of this routine returns incorrect values on the Convex. A vector version was added to QVEX with a separate loop for the maximum and minimum and using the intrinsic MAX and MIN functions. CONVL seems to have been affected by this problem.
Moved from 15JAN88 this date.
4264. August 10, 1987 ANCAL Bill
Variable ICALL was initialized twice in DATA statements in routine GETCAL; removed ICALL from one of the DATA statements.
Moved from 15JAN88 this date.
4265. August 11, 1987 ANCAL Bill
Variable ILIST was initialized twice in DATA statements in routine GETCAL; removed ILIST from one of the DATA statements. The Convex compiler seems to be able to catch only one at a time.
Moved from 15JAN88 this date.
4266. August 11, 1987 TABED Bill
Fixed TEDTR to properly handle bit array (type 7) data in table entries.
Moved from 15JAN88 this date.
4267. August 12, 1987 TABINI Bill
Made the test for existence of a table more rigorous. ISTAB is called to verify the existence of tables with version number less than the maximum. This allows copying tables into empty version numbers less than the maximum.
Moved from 15JAN88 this date.
4268. August 12, 1987 PRTAB Bill
Added column numbers for the first time the column labels are given. Also made test for the maximum length of an entry smarter.
Moved from 15JAN88 this date.
4269. August 12, 1987 CALIB Bill
The time sent the CLBSNR for the label for closure errors by GASOLV was an R*8 whereas CLBSNR expected an R*4. This works okay on a VAX, but on the Convex the messages for one scan came out labeled with a time in a scan 6 hours later. I do believe in spooks; I do, I do.
Moved from 15JAN88 this date.

4270. August 12, 1987 UVLOD Alan Fey/Phil
In subroutine ANTAB there was a typographical error (RBLANK(I) should have been RBLANK(1)) that was causing the z component of the station coordinates to be omitted from the antenna file.
Moved from 15JAN88 this date.
4271. August 14, 1987 Implementation of CALCODE, QUAL Bill
CALCODE and QUAL are now implemented in the selection of sources or calibrators in some tasks. New values passed in the D/CSEL.INC commons are SELQUA and SELCOD, which give the specified qualifier and calibrator code. SOUFIL now uses these in the selection of sources or calibrators. SOUFIL now traps the case when all sources are rejected and returns an error condition rather than selecting all sources or calibrators.
CALCODE and QUAL were added to
CALIB CLCAL SPLIT
SELQUA and SELCOD were initialized in
LISTR BLCAL PCAL TVFLG UVIMG
CALCODE.HLP was improved to explain the new options. Modified files:
SOUFIL DSEL.INC CSEL.INC CALCODE.HLP CALIB CALIB.HLP
DCLB.INC CCLB.INC CLCAL CLCAL.HLP SPLIT SPLIT.HLP
LISTR BLCAL PCAL TVFLG UVIMG
Moved from 15JAN88 this date.
4272. August 18, 1987 CONV1 Bill
Fixed a bug in which an intermediate result exceeded 32767 and the resulting integer overflow blew CONVL out of the water.
Moved from 15JAN88 this date.
4273. August 18, 1987 DATCAL Bill
Modified to deal with autocorrelations. Baseline corrections are not applied and data is not flagged on the basis of bad baseline solutions.
Moved from 15JAN88 this date.
4274. August 18, 1987 ALGSUB Bill
ALGSUB had a bug in the algorithm for dealing with data in the conjugate half plane which caused the u and v and the visibility phases to be negated under some circumstances. This bug only caused a problem in UVSUB as MX flips all of the data to be in the same half plane. Also the size of the conjugate table was increased from 1000 to 5000.
Moved from 15JAN88 this date.
4275. August 18, 1987 UVMDIV Bill
Now copies the CH table when UVDPAD is used. This omission was causing UVMSUB to fail if the data had an IF axis. This problem could affect UVSUB, ASCAL et al. and CALIB.
Moved from 15JAN88 this date.
4276. August 19, 1987 PCAL Bill
Two fixes: (1) filled CALSOU with blanks to keep SOUFIL happy; otherwise it would bomb the program. (2) Corrected data type for NOBS, a call argument in LPCALC (should be I*4).
Moved from 15JAN88 this date.
4277. August 19, 1987 SPLIT Bill
Initialization of the polarization correction is now always turned off when the first call to UVGET is made to get the header. If multiple subarrays were allowed POLSET was bombing SPLIT regardless of the actual number of subarrays.
Moved from 15JAN88 this date.
4278. August 19, 1987 TABMRG Bill
Now copies relevant information from input table such as the number of keyword-value pairs, file creation info, table title, sort order and selection strings. The older version was losing this info which was especially bothersome for those tables with keywords which later software insists on finding. Task TAMRG was affected by this problem.
Moved from 15JAN88 this date.
4279. August 19, 1987 ITBSRT Bill
There was a typo which would prevent sorting on short integer keys into descending order.
Moved from 15JAN88 this date.

4280. August 20, 1987 CGASET Bill
Modified to constrain the amplitude of solutions in the current corrections to be the interpolated value. Previously the real and imaginary part were interpolated independently and the resultant amplitude could be in error if the phases differed significantly.
Moved from 15JAN88 this date
4281. August 20, 1987 MULTI Bill
Fixed numerous small bugs: (1) Cleaned up the logic for writing CL table entries; the old version made random entries throughout any gaps in the data. Also the actual time range covered is written to the file rather than the interval specified. (2) The source name in the SU table is now blank filled rather than zero filled if it is obtained from the catalogue header. (3) Precession is now done to the date of observations rather than to the standard epoch. The standard epoch is now obtained from the catalogue header rather than set in a DATA statement. (4) Several literal integers were changed to declared variables in the call sequence to a number of routines. This would fail on anything but a VAX. (5) In CATMOD, made FREQU an array; this was causing the bandwidth to be written in the SU table as the frequency offset for the second IF, etc. (6) In CATMOD, changed a hardwired 7 (max. number of labeled random parameters to K2PTPN. (7) Added error checking after calls to CALINI and TABCAL. (8) Parameterized to maximum number of subarrays (now 50) allowed in PASSUV; changed order of subarray and antenna in ANTUP for efficiency reasons.
Moved from 15JAN88 this date.
4282. August 21, 1987 UVSRT Bill
The rotation angle was being written on the 4th axis no matter what it was; it is now written on the Dec ... axis.
Moved to 15JAN88 this date.
4283. August 21, 1987 Several Help files Bill
Fixed up some help files:
UVFLG — Gave better explanation of the difference between the action for single- and multi-source files. Also warns the user not to use FLAGVER=0. Incorporated M. Kesteven's suggestions.
UVAVG — Put timing info from R. Simon into the Explain section.
VLBI — Added new calibration and editing tasks.
LISTR — Corrected list of recognized Stokes types: 'R', 'L' are really 'RR', 'LL'.
Moved from 15JAN88 this date
4284. August 21, 1987 UVLOD Bill
Added "P" band to the list of recognized BANDs.
Moved from 15JAN88 this date.
4285. August 24, 1987 CALIB, CALADJ Bill
A temporary I*2 variable MXCNT was overflowing in CALIB routine CLBADJ; it has been changed to an I*4. A similar circumstance arises in CALADJ and the same fix was made.
Moved from 15JAN88 this date.
4286. August 25, 1987 POSSM, POSSM.HLP, DPSM.INC, CPSM.INC Phil
Copied the TST version of POSSM and POSSM.HLP over to NEW so it has the ability to plot BP tables.
Moved from 15JAN88 this date.
4287. August 25, 1987 BPINI, TABBP Phil
Copied these two new subroutines over from TST, needed for initializing and reading BP tables.
Moved from 15JAN88 this date.
4288. August 25, 1987 IMFIT, JMFIT Chris Flatters/Bill
Array ITEMP was incorrectly declared dimension 4 in IMFHI in IMFIT and JMFHI in JMFIT. This problem caused an infinite loop on some machines. The correct dimension is 7.
Moved from 15JAN88 this date and potentially a large number of other places since it was broadcast over BANANA Mail.
4289. August 26, 1987 GAININ Bill
Now checks the sort order of the gain (CL or SN) table and the BL table to make sure that they are in the right order and sorts if necessary. Also the BL table is processed before the CL table now because of a conflict with the LUN used for the CL/SN table and those used in the sorting.
Moved from 15JAN88 this date.

4290. August 27, 1987 BL table problems *Bill*
BLCAL did not have CALSOU initialized to blanks so it always died complaining that no calibrators were specified. The printout giving the average and rms amplitude and phase had another digit of precision added and the BL table was marked in time order if the output file was just created.
GAININ was not giving the table name type to TABSRT so it was blowing up.
Moved from 15JAN88 this date.
4291. August 31, 1987 GAININ *Bill*
Changed to make sure that the needed size of the baseline table is computed on the basis of no more than 2 polarizations. Under some circumstances CALIB was using 4 and deciding that the table wasn't big enough.
Moved from 15JAN88 this date.
4292. August 31, 1987 SPLIT *Bill*
Fixed to not automatically copy BL tables.
Moved from 15JAN88 this date.
4293. September 1, 1987 CLCAL *Bill*
Removed VLBA message. Also corrected format in SN2CL which gave a spurious quote mark.
Moved from 15JAN88 this date.
4294. September 2, 1987 PRTCC *Bruce Macintosh/Bill*
GTPARM was being asked for 16 words whereas 14 was the correct value.
Moved from 15JAN88 this date.
4295. September 2, 1987 CALIB *Bill*
The incorrect number of IFs was being passed to CLBPA when IFs were averaged; this was causing all antennas in all IFs other than the first one to be marked bad.
Moved from 15JAN88 this date.
4296. September 3, 1987 ANCAL.HLP *Bill*
Improved documentation including the need to give source names in the text table and a corrected description of what is actually modified.
Moved from 15JAN88 this date.
4297. September 3, 1987 Parameter passing *Bruce Macintosh/Bill*
PROFL and QMSPL asked GTPARM for an incorrect number of parameters. The passing of parameters in QMSPL is exceedingly messy and confusing.
Moved from 15JAN88 this date.
4298. September 4, 1987 More parameter errors *Bruce Macintosh/Bill*
INMOD and VTESS were asking GTPARM for an incorrect number of parameters.
Moved from 15JAN88 this date.
4299. September 4, 1987 YPGNOT:TVHLD *Kerry*
Initialized variable N32 to 32 and corrected use of mixed data types in a call to the intrinsic MINO.
Moved from 15JAN88 this date.
4300. September 5, 1987 Bit arrays in FITS files *Bill*
Major bug. FITTP and UVLOD were incorrectly handling bit arrays. This screws up the flagging table and usually invalidates all flags (no data is flagged).
Added a pair of generic "Z" routines ZX8XL and ZX8XS to convert between ATPS and FITS bit arrays. R3DTAB and FITTP were modified to use these routines. Also R3DTAB and FITTP were modified to handle table entries as large as the current maximum number of channels (MAXCHA in PUV.D.ING) plus 10 to handle the bandpass tables.
Moved from 15JAN88 this date.
4301. September 7, 1987 INDXR *Bill*
Made the defaults for CPARAM(1, 2) 10, 60 minutes. Nobody seems to be getting this right and these new defaults will at least not set the scan length to 1 integration time (or less). Also changed the help file.
Moved from 15JAN88 this date.

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4302. *September 8, 1987* CLCOR *Phil*
In the clock drift correction mode, the IF frequencies were not being extracted, causing the Real and Imaginary gain values in the output table to be incorrect.
Moved from 15JAN88 this date.
4303. *September 10, 1987* More parameter problems *Bruce Macintosh/Bill*
CLIP and PRTAB asked GTPARM for the incorrect number of parameters.
Moved from 15JAN88 this date.
4304. *September 10, 1987* LISTR.HLP *Bill*
Improved documentation of 'LIST' option.
Moved from 15JAN88 this date.
4305. *September 10, 1987* PCAL.HLP *Bill*
Added a description in the Explain section telling what to do with single-source files and what to do if the parallactic angle correction has already been made.
Moved from 15JAN88 this date.
4306. *September 10, 1987* DBCON *Bill*
Now prohibits combining multi- and single-source files and DOARRAY=.TRUE. when combining multi-source files.
Moved from 15JAN88 this date.
4307. *September 11, 1987* BLCAL *Bill*
Changed units of SOLINT to minutes to agree with the SOLINT.HLP file. The BLCAL.HLP now tells what the units are.
Moved from 15JAN88 this date.
4308. *September 11, 1987* TVFLG *Eric*
Changed DTVF.INC, CTVF.INC, GRIDTB, TVFLG, TVFLG.HLP to correct handling of multiple IFs and channels, to handle windows more carefully, and to add options to set the pixranges and to set the parameters of the initial TV load.
Moved from 15JAN88 this date, nowhere else.
4309. *September 14, 1987* CALIBRAT.HLP *Bill*
Minor changes to improve readability.
Moved from 15JAN88 this date.
4310. *September 18, 1987* NXTFLG *Bill*
There was a bug in the logic flow which caused the last FG table entry to be used if it was deselected in the table or a source which was not selected was included. This latter did not cause errors, but increased execution time.
Moved from 15JAN88 this date.
4311. *September 21, 1987* UVLOD *Gareth Hunt/Eric*
Corrected bad call sequence in which a REAL*4 variable was used where a REAL*8 was required. This led to bad bandwidths from Export format tapes on the Convex.
Moved from 15JAN88 this date.
4312. *September 22, 1987* FITS ASCII tables *Bill*
Several problems involving FITS ASCII tables have been fixed.
FITTP — If the DONEWTAB=-1 option was specified, CH tables were not being written to tape. FITTEXT was broken into two routines, one looping over the tables, and a new routine, EXTWRT, to actually write the table. FITUEX was then modified to call EXTWRT with DOASC true to write the CH table.
TABFRM — When FITTP writes ASCII tables containing short integers they are written with format I6. TABFRM then interpretes I6 and longer as long integers. This confuses the ATPS table routines for specific tables types that know the data types. TABFRM was modified to convert I6 as a short integer.
CHNDAT — This routine was modified to handle CH table integers as either short or long integers.
Moved from 15JAN88 this date.
4313. *September 22, 1987* VLBIN *Phil*
Fixed file-opening routine in VLBIN which was causing it to fail when trying to read a DECODE file from tape.
Moved from 15JAN88 this date.

4314. *September 22, 1987* STFUN Phil/Neil
Removed an END DD structure and replaced with a labelled DD.
Moved from 15JAN88 this date.
4315. *September 23, 1987* QVEX:QPHSRO Bill
Corrected addressing into WKVEC8.
Moved from 15JAN88 this date.
4316. *September 23, 1987* UVGRID Bill
Use of I*2s was resulting in overflows on Convexes when the pseudo-AP memory size was increased to 1 Mword. Since the Convex did not consider this to be an error, the results were erratic. Local variables I, II, INCNT and LIM were converted to I*4s and mixed argument types in several MINO calls were cleaned up.
Moved from 15JAN88 this date.
4317. *September 24, 1987* SELSD Bill
Modified to assume U and V are really RA and Dec in degrees if the BASELINE and W random parameters are present (otherwise they are assumed to be in degrees times frequency. The BASELINE and W random parameters are not added if already present. Also all channels of data are copies rather than only the first one. Added some description to SELSD.HLP about units. This whole system needs cleaning up.
Moved from 15JAN88 this date.
4318. *September 25, 1987* TVFLG, UVIMG Eric
Changed TVFLG to add flagging modes (time range, antenna, clipping), to add rms/mean displays, to correct writing of flag tables, and to control which Stokes are flagged. Changed GRIDTB and UVIMG to add mode to compute rms/mean and to set image units correctly. Updated TVFLG and UVIMG help files. Changed FLAGUP call sequence and changed FLGSTK to allow mask type Stokes parameters. Corrected UVFLG to new FLAGUP call sequence. Also added parameter to DTVF.INC and CTVF.INC.
Moved from 15JAN88 this date, nowhere else.
4319. *October 1, 1987* VLBIN Phil
Was incorrectly filling in the BANDW column of the SU table with the full bandwidth instead of the channel bandwidth. Was also using the rest frequency instead of the band-edge frequency in the calculation of the source velocity.
Moved from 15JAN88 this date.
4320. *October 1, 1987* SETJY, SETJY.HLP Phil
Fixed so is now able to deal with velocity information in a correct manner. Added APARM to the input list so that the user can specify the channel to which the velocity refers; the program then recalculates the velocity to what it should be at the reference frequency. Updated the help file to reflect this change.
Moved from 15JAN88 this date.
4321. *October 1, 1987* ANCAL Phil
Replaced a "." with a ":" in the name string which specified the area in which to look for the T_{99} file.
Moved from 15JAN88 this date.
4322. *October 2, 1987* TVFLG, UVIMG Eric
Changed GRIDTB and TVFLG to check the source number when averaging to build the grids of UVIMG and the master grid of TVFLG. Added the source number to each row of the master TVFLG grid in order to test source number during later averaging. Also added it to each row of the TV grid file so that the CURVALUE display during interactive flagging can display the source name. Added some remarks on sources to TVFLG.HLP.
Moved this date from 15JAN88, nowhere else.
4323. *October 2, 1987* FILAIP, FILAI2 Eric
Changed both to create a 25-record Tektronix image catalog even if there are no TK devices. This will cover the cases of "remote" devices.
Moved from 15JAN88 this date, nowhere else.
4324. *October 5, 1987* VISCNT Bill
The test on the time range of a scan assumed that the time was the start time rather than the center time.
Moved from 15JAN88 this date.

4325. October 6, 1987 ALGSUB Bill
Corrected a frequency scaling problem which occurred in multi-channel (or IF) interpolation when the first frequency channel was not the lowest. This caused problems in MX and UVSUB in multiple frequency applications when CMETHOD = 'GRID' or when CMETHOD = ' ' and the program decided to use the gridded interpolation method.
Moved from 15JAN88 this date.
4326. October 6, 1987 UVGRID Bill
Corrected a potential frequency scaling problem. Shifts were only done correctly for multiple frequency (channels or IFs) data if the data were gridded in a single pass and the first frequency was the reference frequency. Fortunately this is true most of the time. Affected MX.
Moved from 15JAN88 this date.
4327. October 6, 1987 TVFLG Eric
Improved the error testing after the call to GRBOXS. That routine is very general and can return bad windows which must be trapped.
Moved from 15JAN88 this date.
4328. October 6, 1987 QMSPL Kerry
Moved ^O (disables free format QUIC command mode) in second to last output line to near the end of the line. Otherwise, the I/O buffer could get dumped such that a QUIC command in non-free format mode would be split over two lines.
Moved from 15JAN88 same date.
4329. October 6, 1987 ZQMSCL Kerry
The ZQMSCL script in SYSUNIX for spooling QMSPL (and LWPLA) output to the printer have been changed to be more generic. Also, site-specific versions have been created in SYSVLAC1 and SYSNRA01.
Moved from 15JAN88 same date.
4330. October 6, 1987 IMVAL, MAXFIT Eric
Changed:
AU9 — Dropped handling integer images, fixed bug in which blanked values got scaled.
FMAX — Added tests for blanked pixels.
NOM — Added tests for blanked pixels.
PFIT — Added test for zero divide.
Moved from 15JAN88 this date.
4331. October 8, 1987 UVIMG Eric
Changed UVIMG, GRIDTB, TVFLG, and UVIMG.HLP to allow output images of the real or the imaginary parts of the visibility. There seems no point to this option for TVFLG's display however.
Moved from 15JAN88 this date.
4332. October 9, 1987 DOCTXT:MEMO53.MEM Alan
Printable version of ATPS Memo 53, summarizing the main presentations and discussion at the 1987 ATPS workshop.
Moved to 15JAN88 as well.
4333. October 14, 1987 SUBIM Eric
Changed help file to allow higher values of XINC and YINC.
Moved from 15JAN88 this date, nowhere else.
4334. October, 16, 1987 TVFLG and IVAS Eric
Corrected TVFLG to get CURVALUE-like display high enough on the screen. Changed YINIT, per Neil Killeen, to make a simple plus-sign cursor with a hole in the middle. Also changed YCURSE and YCUCOR since the cursor did not point at the pixels it thought it did — it was 2 - 2.0/MAG off in *x* and 1.0/MAG off in *y*. Did this just appear with this firmware revision or does it affect only the Convex for some reason? When first tested on the VAX with firmware version 1, these Y routines were okay.
Moved from 15JAN88 this date and the Convex.

4335. *October 20, 1987* VMS installation *Eric*
Changed ILOAD.COM to give the correct version date, changed IBATCH.COM and IBUILD.COM to drop pseudo-AP load modules from 1600-bpi transport tapes, changed IPROMPT.COM to ask about tape density, and changed TRANSPRT.COM to drop even more for 1600 bpi (including the pseudo-AP load modules).
Moved to 15JAN88 this date.
4336. *October 20, 1987* EXPFIT, IMPFIT *Eric*
Changed EXPFIT to handle lines up to 256 characters in length (some of the SED scripts require this) and to recognize special extensions for COS and UNIX. Corrected missing GO TO which caused the program to stop converting the line at the first exclamation point in the text. Changed the directory names to begin with "." rather than just "/"; this makes the directory names correctly imply, under UNIX, directories below the current default (rather than below root).
Changed IMPFIT to use SUBROUTINE rather than FUNCTION subprograms (the UNIX preprocessor was changing the FUNCTIONS to INTEGER*2, while all else in this program is purely INTEGER). Changed line length limit to 256.
Moved from 15JAN88 since the old ones just didn't work right.
4337. *October 21, 1987* DDT *Eric*
Changed DDTLOAD.001 to use 32-bit integer FITS tapes and dropped the optional write to, then reread from, tape process since the 32 bits should be accurate enough. Changed VM to VTESS since it seems to work better. Changed DDT.HLP and DDTSAVE.HLP, dropping the tape rewrite option. Changed release date and comments in DDTEXEC.001.
Moved to 15JAN88 on Oct 29.
4338. *October 22, 1987* VTESS, UTESS *Eric*
Corrected two bugs: they were adding two reads onto the first beam file, but only clearing one of them and they failed to handle IN3SEQ as advertised.
Moved from 15JAN88 this date.

CHANGE.DOC: 15JAN88 Version as TST

4339. *July 24, 1987* PRTAB *Phil*
Could not recognize BP tables and so ignored the DDHMS option when printing time-like columns. Fixed.
Moved nowhere.
4340. *July 27, 1987* CLCOR *Phil*
An option was added to enable the CL table to be corrected for clock drifts at a telescope. This was being correctly calculated by CALIB, but the drift was only being interpolated between delay calibrators, no extrapolation was possible. This option now enables extrapolation to be done.
Moved nowhere.
4341. *July 30, 1987* Polarization calibration *Bill/Fred*
A new task has been implemented for determining instrumental polarization (PCAL) and the standard calibration routines have been modified to include this correction. New and affected routines and files are described in detail in entry # 4252:
Moved to 15OCT87 on August 3, nowhere else.
4342. *August 3, 1987* BPINI/TABBP *Phil*
Two new subroutines (in the APLNOT area) to create/initialize and do I/O on BP (BandPass) tables.
Moved nowhere.
4343. *August 3, 1987* BPINI/TABBP *Phil*
Add new column to BP table — records reference antenna used.
Moved nowhere.
4344. *August 3, 1987* D/CBPS.INC *Phil*
Had forgotten to put REFANT in the common; this was screwing up the choice of REFANT in the least squares solution in BPASS.
Moved nowhere.

4345. August 4, 1987 PRTAN Bill
Modified to give sensible listings of any feed polarization parameter information.
Moved to 15OCT87 this date.
4346. August 4, 1987 PCAL Bill
Modified to allow specifying BIF and EIF; also shortened the listing of feed parameters and will now deal properly with all of the data in an IF being flagged. Also changed: PCAL.HLP D/CPCL.INC.
Moved to 15OCT87 this date.
4347. August 4, 1987 BPINI/TABBP Phil
Modified size of work buffer used. Also inserted extra column to record reference antenna for second polarization in case it is different from the first.
Moved nowhere.
4348. August 5, 1987 FILLR Neil
(1) Corrected so that data are correctly dropped when shadowed and slightly modified the meaning of the shadow control parameter, DPARM(4). (2) Added BIF and EIF adverbs so that the user can select IFs. Also changed help file, DFLR.INC, and CFLR.INC.
Moved nowhere.
4349. August 6, 1987 CALIB Bill
Added option to print closure errors in excess of given limits. Corrected logic determining the amount of oversampling that could be done in the coarse fringe fitting based on the amount of memory available. Also changed CALIB.HLP and CALIBRAT.HLP.
Moved to 15OCT87 this date.
4350. August 6, 1987 Polarization adverbs Bill
Added the adverbs DOPOL and PMODEL for use in polarization calibration. DOPOL determines if polarization corrections are to be applied and PMODEL contains a polarized point source model. Affected files: POPSDAT.HLP, DOPOL.HLP, PMODEL.HLP, D/CAPL.INC, RUNSYS:NEWPARMS.001. This change requires that POPSGN be rerun and AIPS recompiled and linked. Also corrected typos in PCAL.HLP.
Moved to 15OCT87 this date.
4351. August 7, 1987 OTBSRT Bill
Modified to suppress call to CATIO unless output version number is higher than input version number. This was causing problems for in-place sorts in the calibration routines. The catalogue header only needs to be updated if a new table was created.
Moved to 15OCT87 this date.
4352. August 7, 1987 DOPOL flag Bill
The following routines now have the value of the polarization correction flag DOPOL set to false:
CALIB BLCAL PCAL TVFLG
Moved to 15OCT87 this date.
4353. August 7, 1987 ANCAL John
The system temperature interpolation in GETSYS was being done backwards. That is, the T_{sys} value at time $t - t_2$ was being entered into the CL table rather than the T_{sys} at $t - t_1$. This error is present in ANCAL only. Previous versions of VBANT did not have this problem.
Moved to 15OCT87 and 15JAN88 this date.
4354. August 7, 1987 FILLR Neil
For the case when selecting only the second IF from a data set: correctly computed the reference frequency, u , v , & w and the shadowing limit in wavelengths.
Moved nowhere.
4355. August 10, 1987 CONV2 Bill
Fixed bug in disk-based handling of first and last columns; the wrong array was being multiplied by the convolving function. Affected tasks are CONVL and VM. Also corrected the header comments and changed to flush the output buffer before writing the first column to disk.
Moved to 15OCT87 this date.

4356. August 10, 1987 QVEX:QMAXMI Bill
The QPSAP version of this routine returns incorrect values on the Convex. A vector version was added to QVEX with a separate loop for the maximum and minimum and using the intrinsic MAX and MIN functions. CONVL seems to have been affected by this problem.
Moved to 15OCT87 this date.
4357. August 10, 1987 ANCAL Bill
Variable ICALL was initialized twice in DATA statements in routine GETCAL; removed ICALL from one of the DATA statements.
Moved to 15OCT87 this date.
4358. August 11, 1987 ANCAL Bill
Variable ILIST was initialized twice in DATA statements in routine GETCAL; removed ILIST from one of the DATA statements. The Convex compiler seems to be able to catch only one at a time.
Moved to 15OCT87 this date.
4359. August 11, 1987 TABED Bill
Fixed TEDITR to properly handle bit array (type 7) data in table entries.
Moved to 15OCT87 this date.
4360. August 12, 1987 TABINI Bill
Made the test for existence of a table more rigorous. ISTAB is called to verify the existence of tables with version number less than the maximum. This allows copying tables into empty version numbers less than the maximum.
Moved to 15OCT87 this date.
4361. August 12, 1987 PRTAB Bill
Added column numbers for the first time the column labels are given. Also made test for the maximum length of an entry smarter.
Moved to 15OCT87 this date.
4362. August 12, 1987 GRIDTB Neil
Fixed so that the input and output values of the variables BIF and EIF (which are stored in a CSEL.INC common) are equal.
Moved nowhere.
4363. August 12, 1987 TVFLG Neil
Modified subroutine TVFLGR so that IF information was more correctly maintained internally. This is a problem when starting the task up with only the second IF selected. This fix is only a quick patch-up necessary so that the flagging table was correctly written; the problem runs deeper (spectral line channels will also have this problem, I think) and needs more work on it. I'll leave it for you, Eric. Also fixed bug in subroutine TVFMRK where the channel and IF flags pointers were interchanged for multi-source data file flagging.
Moved nowhere.
4364. August 12, 1987 CALIB Bill
The time sent the CLBSNR for the label for closure errors by GASOLV was an R*8 whereas CLBSNR expected an R*4. This works okay on a VAX, but on the Convex the messages for one scan came out labeled with a time in a scan 6 hours later. I do believe in spooks; I do, I do.
Moved to 15OCT87 this date.
4365. August 12, 1987 POSSM Phil
Modified so that program now has the ability to plot BP tables as well as visibility data.
Moved to 15OCT87 on 25 August.
4366. August 12, 1987 UVLOD Alan Fey/Phil
In subroutine ANTAB there was a typographical error (RBLANK(I) should have been RBLANK(1)) that was causing the z component of the station coordinates to be omitted from the antenna file.
Moved to 15OCT87 this date.
4367. August 12, 1987 POSSM, D/CPSM.INC Phil
Some variables have been moved to another include, changed POSSM and its local includes to reflect these changes.
Moved to 15OCT87 on 25 August.

4368. August 14, 1987 Implementation of CALCODE, QUAL Bill
CALCODE and QUAL are now implemented in the selection of sources or calibrators in some tasks. New values passed in the D/CSEL.INC commons are SELQUA and SELCOD, which give the specified qualifier and calibrator code. SOUFIL now uses these in the selection of sources or calibrators. SOUFIL now traps the case when all sources are rejected and returns an error condition rather than selecting all sources or calibrators.
CALCODE and QUAL were added to
CALIB CLCAL SPLIT
SELQUA and SELCOD were initialized in
LISTR BLCAL PCAL TVFLG UVIMG
CALCODE.HLP was improved to explain the new options. Modified files:
SOUFIL DSEL.INC CSEL.INC CALCODE.HLP CALIB CALIB.HLP
DCLB.INC CCLB.INC CLCAL CLCAL.HLP SPLIT SPLIT.HLP
LISTR BLCAL PCAL TVFLG UVIMG
Moved to 15OCT87 this date.
4369. August 17, 1987 PCAL Bill
Two fixes: (1) filled CALSOU with blanks to keep SOUFIL happy; otherwise it would bomb the program. (2) Corrected data type for NOBS, a call argument in LPCALC (should be I*4).
Moved to 15OCT87 on August 19, 1987.
4370. August 18, 1987 CONV1 Bill
Fixed a bug in which an intermediate result exceeded 32767 and the resulting integer overflow blew CONVL out of the water.
Moved to 15OCT87 this date.
4371. August 18, 1987 DATCAL Bill
Modified to deal with autocorrelations. Baseline corrections are not applied and data is not flagged on the basis of bad baseline solutions.
Moved to 15OCT87 this date.
4372. August 18, 1987 ALGSUB Bill
ALGSUB had a bug in the algorithm for dealing with data in the conjugate half plane which caused the u and v and the visibility phases to be negated under some circumstances. This bug only caused a problem in UVSUB, as MX flips all of the data to be in the same half plane. Also the size of the conjugate table was increased from 1000 to 5000.
Moved to 15OCT87 this date.
4373. August 18, 1987 UVMDIV Bill
Now copies the CH table when UVDPAD is used. This omission was causing UVMSUB to fail if the data had an IF axis. This problem could affect UVSUB, ASCAL *et al.* and CALIB.
Moved to 15OCT87 this date.
4374. August 19, 1987 SPLIT Bill
Initialization of the polarization correction is now always turned off when the first call to UVGET is made to get the header. If multiple subarrays were allowed POLSET was bombing SPLIT regardless of the actual number of subarrays.
Moved to 15OCT87 this date.
4375. August 19, 1987 TABMRG Bill
Now copies relevant information from input table such as the number of keyword-value pairs, file creation info, table title, sort order and selection strings. The older version was losing this info which was especially bothersome for those tables with keywords which later software insists on finding. Task TAMRG was affected by this problem.
Moved to 15OCT87 this date.
4376. August 19, 1987 ITBSRT Bill
There was a typo which would prevent sorting on short integer keys into descending order.
Moved to 15OCT87 this date.
4377. August 20, 1987 CGASET Bill
Modified to constrain the amplitude of solutions in the current corrections to be the interpolated value. Previously the real and imaginary part were interpolated independently and the resultant amplitude could be in error if the phases differed significantly.
Moved to 15OCT87 this date

- 4378.** *August 20, 1987* MULTI *Bill*
Fixed numerous small bugs: (1) Cleaned up the logic for writing CL table entries; the old version made random entries throughout any gaps in the data. Also the actual time range covered is written to the file rather than the interval specified. (2) The source name in the SU table is now blank filled rather than zero filled if it is obtained from the catalogue header. (3) Precession is now done to the date of observations rather than to the standard epoch. The standard epoch is now obtained from the catalogue header rather than set in a DATA statement. (4) Several literal integers were changed to declared variables in the call sequence to a number of routines. This would fail on anything but a VAX. (5) In CATMOD made FREQ0 an array; this was causing the bandwidth to be written in the SU table as the frequency offset for the second IF, etc. (6) In CATMOD, changed a hardwired 7 (max. number of labeled random parameters to K2PTPN. (7) Added error checking after calls to CALINI and TABCAL. (8) Parameterized to maximum number of subarrays (now 50) allowed in PASSUV; changed order of subarray and antenna in ANTUP for efficiency reasons.
Moved to 15OCT87 this date.
- 4379.** *August 21, 1987* UVSRT *Bill*
The rotation angle was being written on the 4th axis no matter what it was; it is now written on the Dec ... axis.
Moved to 15OCT87 this date.
- 4380.** *August 21, 1987* Several Help files *Bill*
Changed several help files:
UVFLG — Gave better explanation of the difference between the action for single- and multi-source files. Also warns the user not to use FLAGVER=0. Incorporated M. Kesteven's suggestions.
UVAVG — Put timing info from R. Simon into the Explain section.
VLBI — Added new calibration and editing tasks.
LISTR — Corrected list of recognized Stokes types, 'R', 'L' are really 'RR', 'LL'.
Moved to 15OCT87 this date
- 4381.** *August 21, 1987* UVL0D *Bill*
Added "P" band to the list of recognized BANDs.
Moved to 15OCT87 this date.
- 4382.** *August 21, 1987* QMSPL *Pat Murphy*
Modified QUIC syntax so that the ^G terminator always follows any ^I command; also moved the ^0 from the last line and put it on the second last. Moved free-format entry (^F) also and added semicolon to vector commands ^U and ^D. All these changes were suggested by Mike Taylor, implemented by me and tested before checking the program back in.
Moved to 15OCT87 on October 6, 1987 by Kerry.
- 4383.** *August 21, 1987* AIPS.COM *Pat Murphy*
Modified VMS version so that when it resets the default protection, it restores it to what it was at the start of the procedure.
Moved nowhere.
- 4384.** *August 24, 1987* Misspellings *Bill*
Corrected the spelling of "initializing" in the following routines: BLINI, BPINI, FLGINI, GAINI, SOURNU, TYINI.
Moved nowhere.
- 4385.** *August 24, 1987* CALIB, CALADJ *Bill*
A temporary I*2 variable MXCNT was overflowing in CALIB routine CLBADJ; it has been changed to an I*4. A similar circumstance arises in CALADJ and the same fix was made.
Moved to 15OCT87 this date.
- 4386.** *August 25, 1987* POSSM, POSSM.HLP *Phil*
The BPVER adverb was missing from the help file as was the explanation of how to plot BandPass tables. Set the BL table version to -1 within the program to avoid printing a misleading and invalid (in this case) error message.
Moved to 15OCT87 this date.
- 4387.** *August 25, 1987* IMFIT, JMFIT *Chris Flatters/Bill*
Array ITEMp was incorrectly declared dimension 4 in IMFHI in IMFIT and JMFHI in JMFIT. This problem caused an infinite loop on some machines. The correct dimension is 7.
Moved to 15OCT87 this date and potentially a large number of other places since it was broadcast over BANANA Mail.

4388. August 25, 1987 VLBIN, VLBIN.HLP Phil
Set a couple more traps to watch for cross-correlation functions trying to sneak through. Put in an option to do the amplitude portion of the FBS correction only; this is normally all that is needed and speeds the whole process up tremendously, especially for line data. Also changed DSET.INC and CSET.INC.
Moved nowhere.
4389. August 26, 1987 GAININ Bill
Now checks the sort order of the gain (CL or SN) table and the BL table to make sure that they are in the right order and sorts if necessary. Also the BL table is processed before the CL table now because of a conflict with the LUN used for the CL/SN table and those used in the sorting.
Moved to 15OCT87 this date.
4390. August 27, 1987 BL table problems Bill
BLCAL did not have CALSOU initialized to blanks so it always died complaining that no calibrators were specified. The printout giving the average and rms amplitude and phase had another digit of precision added and the BL table was marked in time order if the output file was just created.
GAININ was not giving the table name type to TABSRT so it was blowing up.
Moved to 15OCT87 this date.
4391. August 28, 1987 gripes Eric
You may have GRDROP'ped a gripe and had it responded to by us anyway. Changed AUC to actually compress the file when dropping some gripe other than the highest numbered one. One can't just modify the directory since the directory entries do not contain an end point for each gripe, and hence an intermediate gripe is just tagged on to the end of the previous one by the old code. Also changed GRITP a little to avoid copying extra characters which could confuse GRTOTEX.
Moved nowhere so far.
4392. August 31, 1987 GAININ Bill
Changed to make sure that the needed size of the baseline table is computed on the basis of no more than 2 polarizations. Under some circumstances CALIB was using 4 and deciding that the table wasn't big enough.
Moved to 15OCT87 this date.
4393. August 31, 1987 SPLIT Bill
Fixed to not automatically copy BL tables.
Moved to 15OCT87 this date.
4394. September 1, 1987 CLCAL Bill
Removed VLBA message. Also corrected format in SN2CL which gave a spurious quote mark.
Moved to 15OCT87 this date.
4395. September 1, 1987 DOBAND Phil
A new adverb to enable spectral line bandpass corrections was added to POPSDAT.HLP, DAPL.INC, CAPL.INC and NEWPARMS.001. POPSGN was also run and a help file generated.
Moved nowhere this date.
4396. September 2, 1987 PRTCC Bruce Macintosh/Bill
GTPARM was being asked for 16 words whereas 14 was the correct value.
Moved to 15OCT87 this date.
4397. September 2, 1987 CALIB Bill
The incorrect number of IFs was being passed to CLBPA when IFs were averaged; this was causing all antennas in all IFs other than the first one to be marked bad.
Moved to 15OCT87 this date.
4398. September 3, 1987 ANCAL.HLP Bill
Improved documentation including the need to give a source names in the text table and a corrected description of what is actually modified.
Moved to 15OCT87 this date.

4399. *September 3, 1987* Parameter passing *Bruce Macintosh/Bill*
PROFL and QMSPL asked GTPARM for an incorrect number of parameters. The passing of parameters in QMSPL is exceedingly messy and confusing.
Moved to 15OCT87 this date.
4400. *September 4, 1987* More parameter errors *Bruce Macintosh/Bill*
IMMOD and VTESS were asking GTPARM for an incorrect number of parameters.
Moved to 15OCT87 this date.
4401. *September 4, 1987* YPGNOT:TVHLD *Kerry*
Initialized variable #32 to 32 and corrected use of mixed data types in a call to the intrinsic MINO.
Moved to 15OCT87 this date.
4402. *September 5, 1987* Bit arrays in FITS files *Bill*
Major bug. FITTP and UVLOD were incorrectly handling bit arrays. This screws up the flagging table and usually invalidates all flags (no data is flagged).
Added a pair of generic "Z" routines ZX8XL and ZX8X8 to convert between *ATPS* and FITS bit arrays. R3DTAB and FITTP were modified to use these routines. Also R3DTAB and FITTP were modified to handle table entries as large as the current maximum number of channels (MAXCHA in PUV.D. INC) plus 10 to handle the bandpass tables.
Moved to 15OCT87 this date.
4403. *September 7, 1987* CLCOR *Bill*
Added option to remove or add the phase of the parallactic angle to specified phase residuals in the CL table. Also changed CLCOR.HLP. This allows using the *ATPS* polarization calibration routines on data which have had the parallactic angle correction made; this includes VLA data which has been processed by the Dec-10.
Moved nowhere.
4404. *September 7, 1987* INDXR *Bill*
Made the defaults for CPARAM(1, 2) 10, 60 minutes. Nobody seems to be getting this right and these new defaults will at least not set the scan length to 1 integration time (or less). Also changed the help file.
Moved to 15OCT87 this date.
4405. *September 7, 1987* TABED *Bill*
Allowed conditioning an operation on a character string with standard *ATPS* wildcards. Numeric conditioning test can now use an arbitrary array element rather than just the first element of a table entry.
Moved nowhere.
4406. *September 8, 1987* TABED.HLP *Bill*
Added an EXPLAIN section including several examples.
Moved nowhere.
4407. *September 8, 1987* CLCOR *Phil*
In the clock drift correction mode, the IF frequencies were not being extracted, causing the Real and Imaginary gain values in the output table to be incorrect.
Moved to 15OCT87 this date.
4408. *September 10, 1987* More parameter problems *Bruce Macintosh/Bill*
CLIP and PRTAB asked GTPARM for the incorrect number of parameters.
Moved to 15OCT87 this date.
4409. *September 10, 1987* LISTR.HLP *Bill*
Improved documentation of 'LIST' option.
Moved to 15OCT87 this date.
4410. *September 10, 1987* PCAL.HLP *Bill*
Added a description in the Explain section telling what to do with single-source files and what to do if the parallactic angle correction has already been made.
Moved to 15OCT87 this date.

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4411. *September 10, 1987* DBCON *Bill*
Now prohibits combining multi- and single-source files and DOARRAY = .TRUE. when combining multi-source files.
Moved to 15OCT87 this date.
4412. *September 10, 1987* INCVEX:D/EAPC.INC *Bill*
Increased the size of the "AP memory" to allow in core 1024x1024 FFTs on the Convexes.
Moved nowhere.
4413. *September 11, 1987* BLCAL *Bill*
Changed units of SOLINT to minutes to agree with the SOLINT.HLP file. The BLCAL.HLP now tells what the units are.
Moved to 15OCT87 this date.
4414. *September 11, 1987* MX *Bill*
Changed default handling of IN2DISK. The default is now the highest numbered disk with sufficient space.
Moved nowhere.
4415. *September 11, 1987* Convex AP memory size *Bill*
Added parameters to INCVEX:DAPC.INC to give the AP memory size allocated. QVEX:QINIT and QRLSE now set these values in /DCHCOM/.
Moved nowhere.
4416. *September 11, 1987* TVFLG *Eric*
Changed:
DTVF.INC — added parameters.
CTVF.INC — added parameters.
GRIDTB — changed to reset channel and IF ranges to user-specified values.
TVFLG — (1) changed to use absolute channel and IF numbers throughout.
— (2) when blanking *wv* master file, changed to set offset for IF and channel correctly.
— (3) when blanking master *wv* file, changed to make sure windows don't exceed image size.
— (4) corrected test on CURVALUE formats to absolute value to handle phases properly.
— (5) added interactive options to set amp, phase, and/or rms TV load pixel ranges.
— (6) added adverbs to set the initial type, pixrange, IF, and channel for the first TV load.
TVFLG.HLP — Added explanation of new DPARM adverbs (initial TV load). Clarified how the flagging is done.
Moved to 15OCT87 this date, nowhere else.
4417. *September 14, 1987* CALIBRAT.HLP *Bill*
Minor changes to improve readability.
Moved to 15OCT87 this date.
4418. *September 14, 1987* CLCOR, CLCOR.HLP *Phil*
Added option to correct antenna gains for gross pointing errors. Help file updated to reflect this change. Fixed minor bug in delay correction option which was not updating the group and phase delay columns.
Moved nowhere.
4419. *September 18, 1987* NXTFLG *Bill*
There was a bug in the logic flow which caused the last FG table entry to be used if it was deselected in the table or a source which was not selected was included. The latter did not cause errors, but increased execution time.
Moved to 15OCT87 this date.
4420. *September 21, 1987* UVLOD *Gareth Hunt/Eric*
Corrected bad call sequence in which a REAL*4 variable was used where a REAL*8 was required. This led to bad bandwidths from Export format tapes on the Convex.
Moved to 15OCT87 this date.
4421. *September 22, 1987* VLBIN *Phil*
Fixed file-opening routine in VLBIN which was causing it to fail when trying to read a DECODE file from tape.
Moved to 15OCT87 this date.
4422. *September 22, 1987* STFUN *Phil/Neil*
Removed an END D0 structure and replaced with a labelled D0.
Moved to 15OCT87 this date.

- 4423. September 22, 1987** FITS ASCII tables *Bill*
Several problems involving FITS ASCII tables have been fixed.
FITTP — If the DONEWTAB=-1 option was specified, CH tables were not being written to tape. FITEXT was broken into two routines, one looping over the tables, and a new routine, EXTWRT, to actually write the table. FITUEX was then modified to call EXTWRT with DOASC true to write the CH table.
TABFRM — When FITTP writes ASCII tables containing short integers they are written with format I6. TABFRM then interprets I6 and longer as long integers. This confuses the AIPS table routines for specific tables types that know the data types. TABFRM was modified to convert I6 as a short integer.
CHNDAT — This routine was modified to handle CH table integers as either short or long integers.
Moved to 15OCT87 this date.
- 4424. September 23, 1987** QVEX:QPHSRO *Bill*
Corrected addressing into WKVEC8.
Moved to 15OCT87 this date.
- 4425. September 23, 1987** UVGRID *Bill*
Use of I*2s was resulting in overflows on Convexes when the pseudo-AP memory size was increased to 1 Mword. Since the Convex did not consider this to be an error, the results were erratic. Local variables I, II, INCNT and LIM were converted to I*4s and mixed argument types in several MINO calls were cleaned up.
Moved to 15OCT87 this date.
- 4426. September 24, 1987** SELSD *Bill*
Modified to assume U and V are really RA and Dec in degrees if the BASELINE and W random parameters are present (otherwise they are assumed to be in degrees times frequency). The BASELINE and W random parameters are not added if already present. Also all channels of data are copies rather than only the first one. Added some description to SELSD.HLP about units. This whole system needs cleaning up.
Moved to 15OCT87 this date.
- 4427. September 24, 1987** INCVEX:DAPC.INC *Bill*
Reduced the size of the pseudo-AP memory from 1 Mword to 256 KWord. The larger size was causing too many I*2 overflows which the Convexes don't trap. After the software update, most of these problems should be cured and we can try it again.
Moved nowhere this date.
- 4429. September 25, 1987** TVFLG, UVIMG *Eric*
Changed:
DTVF.INC — Added parameters.
CTVF.INC — Added parameters.
TVFLG — (a) Added flagging modes of time range (all baselines) and time range (1 antenna with all others); the former reduces requirements on the FG file.
— (b) Added two modes to flag data if the current image is outside a specified range for the corresponding pixel. One lets the user set the clip levels with TV interaction, the other with numbers from the terminal.
— (c) Corrected writing of time flagging commands to FG file.
— (d) Added mode to display rms/mean to computation, pix range selection and type selection.
— (e) Added another call to UVPGET to force the uv header common to match the input file at flagging time.
— (f) Added option to set the Stokes to be flagged separately from the Stokes to be displayed and gave it sensible defaults. Although this is an interactive option, it applies to all flags determined during the given execution of TVFLG. Also corrected call sequence to FLAGUP.
GRIDTB — Added mode to compute rms/mean and fixed it to set image units correctly (for phase, rms/mean). Corrected bug which restricted it to one channel and IF.
UVIMG — Added mode to compute rms/mean and fixed it to set image units correctly (for phase, rms/mean)
TVFLG.HLP — Added mode of rms/mean amplitude and tried to improve the description of STOKES and which correlators will be flagged. Brought the small Explain section up to date.
UVIMG.HLP — Added mode of rms/mean amplitude.
FLAGUP — Changed call sequence, dropping CATBLK which also had to come through the MAPHDR common.
FLGSTK — Changed to allow STOKES in the form of masks of four 1's and 0's, requiring no special interpretation.
UVFLG — Corrected to new FLAGUP call sequence.
Moved to 15OCT87 this date, nowhere else.

4428. September 25, 1987 MV2C06CC Bill
Updated description of CC table.
Moved nowhere.

4430. September 28, 1987 IMLOD Eric
Dropped unused variables MAX and MIN from a declaration. These are reserved generic built-in function names and we should never use them as variable names. I wonder how often this has been done.
Moved nowhere.

4431. September 30, 1987 New Model "Q" routines Bill
Added "Q" routines to compute Gaussian and optically thin, uniform sphere models. Multiple components may be processed.
QGASUB — Subtracts Gaussian model from *uv* data.
QGADIV — Divides Gaussian model into *uv* data.
QSPSUB — Subtracts spherical model from *uv* data.
QSPDIV — Divides spherical model into *uv* data. Files added:
QPSAP: QGASUB QGADIV QSPSUB QSPDIV
QFPS16: QGASUB QGADIV QSPSUB QSPDIV
Q120B: GASUB.VFC GADIV.VFC SPHSUB.VFC SPHDIV.VFC
Q120B: GASUB GADIV SPHSUB SPHDIV
Q5000: GASUB.VFC GADIV.VFC SPHSUB.VFC SPHDIV.VFC
Q5000: GASUB GADIV SPHSUB SPHDIV
Moved nowhere.

4432. September 30, 1987 New models implemented Bill
Implemented the new model types (Gaussian and optically thin, uniform sphere) in VISDFT in the same manner as point components were previously handled. UVSUB and CALIB allow specifying a single component model in adverb SMODEL. These new model types can be processed only with CMETHOD='DFT'. Several modifications were also required to allow CC tables attached to *uv* data files (produced by UVFIT) to be processed. Specific changes:
D/CGDS.INC — Added PARMOD to carry model type and parameters.
VISDFT — Changed to copy model parameters to "AP memory" and call appropriate routines for the model processing.
SETGDS — Changed to allow CC tables associated with *uv* data files.
GRDAT — Fixed to find correct RA and Dec axes rather than assuming 1 and 2.
GETCTL — Revised to deal with CC tables on *uv* data.
SMODEL.HLP — Corrected model codes.
UVSUB — Revised to use adverb SMODEL, to pass parameters in PARMOD, and to add history about non-point models. Changed UVSUB, UVSUB.HLP, DSUB.INC, and CSUB.INC.
CALIB — Revised to pass model parameters in SMODEL to VISDFT. Updated CALIB.HLP about the use of SMODEL. Added history entry if non-point model passed in SMODEL.
BLCAL — Also PCAL, ASCAL, VSCAL and VBFIT — Zeroed PARMOD(1) to avoid problems; the new models will be used if they are in a CC table, but cannot be passed as adverbs.
Moved nowhere.

4433. October 1, 1987 VLBIN Phil
Was incorrectly filling in the BANDW column of the SU table with the full bandwidth instead of the channel bandwidth. Was also using the rest frequency instead of the band-edge frequency in the calculation of the source velocity.
Moved to 15OCT87 this date.

4434. October 1, 1987 SETJY, SETJY.HLP Phil
Fixed so is now able to deal with velocity information in a correct manner. Added APARM to the input list so that the user can specify the channel to which the velocity refers, the program then recalculates the velocity to what it should be at the reference frequency. Updated the help file to reflect this change.
Moved to 15OCT87 this date.

4435. October 1, 1987 BPINI, TABBP Phil
Modified the two bandpass table I/O routines such that separate IFs are not now stored as separate rows but as a third dimension within the table.
Moved nowhere.

4436. October 1, 1987 D/CSEL.INC Phil
These two includes have been modified for the spectral line bandpass calibration routines. Changing them means the following tasks and subroutines have had to be recompiled and relinked:
- | | | | | | | |
|---------|--------|--------|--------|--------|--------|--------|
| APGNOT: | CLCAL | LISTR | POSSM | SPLIT | UVIMG | |
| QPGNOT: | BLCAL | CALIB | PCAL | | | |
| YPGNOT: | TVFLG | | | | | |
| APLNOT: | BLGET | BLSET | CALADJ | CGASET | CLUPDA | CSLGET |
| APLNOT: | DATCAL | DATFLG | DATGET | DATPOL | DGHEAD | GAININ |
| APLNOT: | GRIDTB | IMCREA | INDXIN | NXTFLG | POLSET | SELSMG |
| APLNOT: | SOUFIL | UVGET | VISCHT | | | |
| QNOT: | MAKMAP | | | | | |
- Moved nowhere.
4437. October 1, 1987 ANCAL Phil
Replaced a "." with a ":" in the name string which specified the area in which to look for the $T_{s,y}$ file.
Moved to 15OCT87 this date.
4438. October 2, 1987 TVFLG, UVIMG Eric
Changed GRIDTB and TVFLG to check the source number when averaging to build the grids of UVIMG and the master grid of TVFLG. Added the source number to each row of the master TVFLG grid in order to test source number during later averaging. Also added it to each row of the TV grid file so that the CURVALUE display during interactive flagging can display the source name. Added some remarks on sources to TVFLG.HLP.
Moved this date to 15OCT87, nowhere else.
4439. October 2, 1987 FILAIP, FILAI2 Eric
Changed both to create a 25-record Tektronix image catalog even if there are no TK devices. This will cover the cases of "remote" devices.
Moved to 15OCT87 this date, nowhere else.
4440. October 5, 1987 UVFIT Bill
Added the ability to access multi-source files and to fit to only the amplitudes of the visibilities. Moved local common to D/CUFT.INC include. Also updated UVFIT.HLP. The source name is now added as a KEYWORD to the CC file if written.
Moved nowhere.
4441. October 5, 1987 VISCNT Bill
The test on the time range of a scan assumed that the time was the start time rather than the center time.
Moved to 15OCT87 this date.
4442. October 6, 1987 UVMOD Bill
Cleaned up many items. Now all channels and IFs are processed and the appropriate operation is performed on the Stokes axes. UVMOD should now work correctly for all types of uv visibility data currently supported in ATPS.
Moved nowhere.
4443. October 6, 1987 ALGSUB Bill
Corrected a frequency scaling problem which occurred in multi-channel (or IF) interpolation when the first frequency channel was not the lowest. This caused problems in MX and UVSUB in multiple frequency applications when CMETHOD = 'GRID' or when CMETHOD = ' ' and the program decided to use the gridded interpolation method.
Moved to 15OCT87 this date.
4444. October 6, 1987 UVGRID Bill
Corrected a potential frequency scaling problem. Shifts were only done correctly for multiple frequency (channels or IFs) data if the data were gridded in a single pass and the first frequency was the reference frequency. Fortunately this is true most of the time. Affected MX.
Moved to 15OCT87 this date.
4445. October 6, 1987 TVFLG Eric
Improved the error testing after the call to GRBOYS. That routine is very general and can return bad windows which must be trapped.
Moved to 15OCT87 this date.

4446. October 6, 1987 QMSPL Kerry
Moved ^O (disables free format QUIC command mode) in second to last output line to near the end of the line. Otherwise, the I/O buffer could get dumped such that a QUIC command in non-free format mode would be split over two lines.
Moved to 15OCT87 same date.
4447. October 6, 1987 ZQMSCL Kerry
The ZQMSCL script in SYSUNIX for spooling QMSPL (and LWPLA) output to the printer have been changed to be more generic. Also, site-specific versions have been created in SYSVLAC1 and SYSNRA01.
Moved to 15OCT87 same date.
4448. October 6, 1987 IMVAL, MAXFIT Eric
Changed:
AU9 — Dropped handling integer images, fixed bug in which blanked values got scaled.
FMAX — Added tests for blanked pixels.
MOM — Added tests for blanked pixels.
PFIT — Added test for zero divide.
Moved to 15OCT87 this date.
4449. October 8, 1987 UVIMG Eric
Changed UVIMG, GRIDTB, TVFLG, and UVIMG.HLP to allow output images of the real or the imaginary parts of the visibility. There seems no point to this option for TVFLG's display however.
Moved to 15OCT87 this date.
4450. October 9, 1987 UVPGET Bill
Modified to check only the first 4 characters of UU-L, VV-L and WW-L to allow the projection type to be included. Also modified to allow more correct handling of randomly sampled single-dish data by allowing RA-- and DEC-, etc. instead of UU-L, etc. and adding a new word to the uv header common (D/CUVH.INC) to tell which type the data are.
Moved nowhere.
4451. October 9, 1987 UVMAP, MX Bill
Modified to pick up the projection type from UU-L axis of the input data; if it is blank '-SIN' is used. Also the uv data type is checked to make sure that the data is interferometer type data and any old x and/or y shift information is not lost from the header.
In MX, also fixed bug which caused the x axis size to be doubled for small images when the image was not being cleaned.
Moved nowhere
4452. October 9, 1987 IM2UV Bill
New task. IM2UV FFTs an image and converts the result to a uv data file. The result can then be combined with interferometer visibility data and/or retransformed to the image plane with UVMAP or MX. Projection types will be preserved in this operation. Also: IM2UV.HLP, D/CI2U.INC.
Moved nowhere.
4453. October 9, 1987 D/VAPT.INC Bill
Added IM2UV to list of AP tasks.
Moved nowhere.
4454. October 9, 1987 DBCON Bill
Made several changes related to the more accurate uv data labeling. (1) The data types (interferometer or single dish) of the two files must agree. (2) The default projection (from UU-L, etc.) is taken to be "-SIN" and is filled in if not present. Incompatible projections will cause DBCON to refuse. Also changed: DDBC.INC, CDBC.INC.
Moved nowhere.
4455. October 9, 1987 DOCTXT:MEMO53.MEM Alan
Printable version of AIPS Memo 53, summarizing the main presentations and discussion at the 1987 AIPS workshop.
Moved to 15OCT87 as well.

4456. October 10, 1987 BPINI, TABBP, DSEL.INC, CSEL.INC Phil
Two new columns were added to the BP table in order to record the bandwidth of a channel and the reference frequency of the IFs held in the table. These changes necessitated minor changes in DSEL.INC and CSEL.INC which, of course, means the following tasks and subroutines have had to be recompiled and relinked:
APGNOT: CLCAL LISTR POSSM SPLIT UVING
QPGNOT: BLCAL CALIB PCAL
YPGNOT: TVFLG
APLNOT: BLGET BLSET CALADJ CGASET CLUPDA CSLGET
APLNOT: DATCAL DATFLG DATGET DATPOL DGHEAD GAININ
APLNOT: GRIDTB IMCREA INDXIN NXTFLG POLSET SELSMG
APLNOT: SOUFIL UVGET VISCNT
QNOT: MAKMAP
Moved nowhere.
4457. October 10, 1987 POSSM, POSSM.HLP Phil
Several changes: (1) Modified so that it will now generate a separate plot file for each IF. (2) The velocity calculations are now done correctly. (3) The plot labelling has been substantially improved.
Moved nowhere.
4458. October 12, 1987 UVPGET Bill
Several more single-dish modifications. Now distinguishes between unprojected ('RA ', 'DEC ') and projected ('RA- . . . ', 'DEC- . . . ') with TYPUVD = 1 or 2. Also will allow substitution of 'RECEIVER' in place of the 'BASELINE' random parameter.
Moved nowhere.
4459. October 14, 1987 UVPGET Bill
Had values of TYPUVD for projected and unprojected single-dish data reversed.
Moved nowhere.
4460. October 14, 1987 SUBIM Eric
Changed help file to allow higher values of XINC and YINC.
Moved to 15OCT87 this date, nowhere else.
4461. October 15, 1987 Single-dish gridding Bill
Cleaned up the software involved with gridding single-dish data into an image. The revised routines make use of the improved data labeling and TYPUVD determined by UVPGET. The concept of IFs was added; the full range of *ATPS* projective geometries is now supported.
PRTSD — Selection by IF added, the receiver number is printed if space is available. Also PRTSD.HLP.
SELSD — Now allows the specification of the projective geometry type. Also changed SELSD.HLP.
GRIDR — Selection by IF added, better handling of polarization, and projective geometry type determined from the RA random parameter. Also GRIDR.HLP.
Moved nowhere.
4462. October 15, 1987 FITS table keywords Bill
Corrected a number of problems encountered reading Green Bank single-dish tapes. Until we implement hierarchal keywords in *ATPS* tables, 'SINGLDSH' keywords are ignored.
IMLOD, UVLOD and UVERR now have PARAMETERized declarations of the size of the arrays containing table KEYWORD information and the size of these arrays is passed to TABHDR.
TABHDR now checks the size of the KEYWORD arrays, ignores SINGLDSH keywords and does a better job of detecting and reporting difficulties.
GTWCRD was returning an incorrect value of the error code for complex table header records.
Moved nowhere.
4463. October 15, 1987 More Single dish Bill
Changed the single-dish random parameter type 'RECEIVER' to 'BEAM'. Routines modified are UVPGET and PRTSD.
Moved nowhere.

4464. *October 16, 1987* More Tables cleanup *Bill*
Made the following modifications to allow processing of SINGLDSH tables in IMLOD:
IML0D — Pretends to have read an EOF if too many tables of a given type are found; this allows writing multiple files to pick up all the tables.
TABHDR — Calls SDTCRD to crack SINGLDSH cards. Now sets ITANKY to the number of keywords so that MAKTAB will create a file with enough space for keywords. Tables with SINGLDSH entries are given AIPS table type 'SD'.
SDTCRD — New routine. Reads a selected list of SINGLDSH keywords. Receiver-dependent values have the receiver number appended to the end of the keyword name to allow distinguishing them.
Moved nowhere.
4465. *October, 16, 1987* TVFLG and IVAS *Eric*
Corrected TVFLG to get CURVALUE-like display high enough on the screen. Changed YINIT, per Neil Killeen, to make a simple plus-sign cursor with a hole in the middle. Also changed YCURSE and YCUCOR since the cursor did not point at the pixels it thought it did — it was 2 - 2.0/MAG off in *x* and 1.0/MAG off in *y*. Did this just appear with this firmware revision or does it affect only the Convex for some reason? When first tested on the VAX with firmware version 1, these Y routines were okay.
Moved to 15OCT87 this date and the Convex.
4466. *October 20, 1987* DBPS.INC, CBPS.INC *Phil*
Many new parameters added to these local includes for BPASS.
Moved nowhere.
4467. *October 20, 1987* EXPFIT, IMPFIT *Eric*
Changed EXPFIT to handle lines up to 256 characters in length (some of the SED scripts require this) and to recognize special extensions for COS and UNIX. Corrected missing GO TO which caused the program to stop converting the line at the first exclamation point in the text. Changed the directory names to begin with "./" rather than just "/"; this makes the directory names correctly imply, under UNIX, directories below the current default (rather than below root).
Changed IMPFIT to use SUBROUTINE rather than FUNCTION subprograms (the UNIX preprocessor was changing the FUNCTIONS to INTEGER*2, while all else in this program is purely INTEGER). Changed line length limit to 256.
Moved to 15OCT87 since the old ones just didn't work right.
4468. *October 20, 1987* VMS installation *Eric*
Changed ILOAD.COM to give the correct version date, changed IBATCH.COM and IBUILD.COM to drop pseudo-AP load modules from 1600-bpi transport tapes, changed IPR0MPT.COM to ask about tape density, and changed TRANSPRT.COM to drop even more for 1600 bpi (including the pseudo-AP load modules).
Moved from 15OCT87 this date.
4469. *October 21, 1987* SDTCRD *Bill*
Added single-dish keywords 'FRONTEND', 'BW', 'PTCON1', 'PTCON2' and 'PTCON3' to the list of keywords to read. Corrected the spelling of 'VELOCITY' to the standard misspelling 'VELOCTY'.
Moved nowhere.
4470. *October 21, 1987* CALIB.HLP *Bill*
Improved the description of the use of UVRANGE.
Moved nowhere.
4471. *October 22, 1987* VTESS, UTESS *Eric*
Corrected two bugs: they were adding two reads onto the first beam file, but only clearing one of them and they failed to handle IN3SEQ as advertised.
Moved to 15OCT87 this date.
4472. *October 26, 1987* SELSD *Bill*
Fixed a number of minor bugs involving handling the header.
Moved nowhere.
4473. *October 27, 1987* SELSD *Bill*
Fixed type mismatch in call to XYPIX and added projection types to the regular axis RA and dec so that XYPIX will work okay.
Moved nowhere.

4474. October 29, 1987 MAIL-REMINDER.* Pat Murphy
Put the following VMS-specific command files in SYSVMS so people can easily get them via AIPSSERV: MAIL-REMINDER.COM, MRLOGIN.COM, MRLOGOUT.COM, REMINDER.DIS, NOTICE.TXT. Also put MAIL-REMINDER.DOC in DOCTXT. This facility is for BANANA mail recipients; see the notice sent out on BANANA mail today for more details. Moved nowhere.
4475. October 29, 1987 DDT Eric
Changed DDTLOAD.001 to use 32-bit integer FITS tapes and dropped the optional write to, then reread from tape process since the 32 bits should be accurate enough. Changed VM to VTESS since it seems to work better. Changed DDT.HLP and DDTSAVE.HLP, dropping the tape rewrite option. Changed release date and comments in DDTEEXEC.001. Moved from 15OCT87 this date.
4476. October 29, 1987 MOMNT Scott Stevens/Neil/Phil
Received a modified MOMNT which has the totally non-standard (such as equivalencing L*1 to R*4) features removed. The new version was placed into the APGNOT area and should work quite happily on non-VMS machines. Moved nowhere.
4477. October 30, 1987 SELSD Bill
Modified CATBLK used by SETLOC to trick XYPIX into actually projecting coordinates. The RA and DEC axes were temporarily moved to the first two axes and the coordinate reference pixel was zeroed. Moved nowhere.
4478. October 30, 1987 Misc. Eric/Kerry
Changed MAPOPN, NITMAP, and IENHNS to DATA an array of variables rather than the individual scalars to which the elements of the arrays are EQUIVALENCED. Moved nowhere.
4479. October 30, 1987 D/CSEL.INC Phil
Two bandpass variables added to these commons. All programs which use them to be recompiled and relinked later. Moved nowhere.
4480. October 30, 1987 Bandpass routines Phil
Inserted the following routines into APLNOT: DATBND, BPASET, BPGET, SCLOAD, SCINTP, IOBSRC, and DECIND. These are the routines which will apply BP tables to spectral-line data. Also modified UVGET and DATGET to allow application of the bandpass correction. Moved nowhere.
4481. October 30, 1987 Bandpass calibration Phil
Modified the following tasks, their local includes and help files to be able to do bandpass calibration:
CALIB LISTR POSSM SPLIT TVFLG UVFIT UVIMG
Tasks CLCAL, BLCAL, and PCAL were modified to specifically forbid bandpass calibration. These changes necessitated the compiling and relinking of the following:
APGNOT: CLCAL LISTR POSSM SPLIT UVIMG
QPGNOT: BLCAL CALIB PCAL
YPGNOT: TVFLG
APLNOT: BLGET BLSET CALADJ CGASET CLUPDA CSLGET
APLNOT: DATCAL DATFLG DATGET DATPOL DGHEAD GAININ
APLNOT: GRIDTB IMCREA INDXIN NITFLG POLSET SELSMG
APLNOT: SOUFIL UVGET VISCNT DATBND BPASET BPGET
APLNOT: SCLOAD SCINTP IOBSRC DECIND
QNOT: MAKMAP
APGNOT UVFIT
Moved nowhere.
4482. October 30, 1987 CALIB.HLP Bill
Improved the description of UVRANGE. Moved nowhere.
4483. October 30, 1987 POSSM Phil
Changed to make more sensible labels for km/s and MHz. Moved nowhere.

4484. November 1, 1987 BPASS Phil
New task. BPASS generates the BP tables which can be used to correct spectral line format data for the complex response of the bandpass function. The program has two modes: (1) it can perform a least-squares decomposition of the visibility data of a calibrated continuum source in order to determine the antenna-based complex bandpass functions, or (2) it will pass autocorrelation data directly to the BP tables (these BP entries will of course have no phase information). The BP tables can then be applied to multi-source data sets by using the DOBAND option. Also changed NEWPARMS .001 to set defaults for DOBAND and BPVER.
Moved nowhere.
4485. November 2, 1987 CHNDAT Bill
Modified to search only actual number of axes (K2DIM) rather than the maximum possible (K2PTPN). If an unused axis had type IF, then CHNDAT was failing.
Moved nowhere
4486. November 2, 1987 AXEFND Bill
Modified precursor comments to tell how to search only the actual number of axes or random parameters.
Moved nowhere.
4487. November 3, 1987 GRIDR Bill
Now only calls CHNDAT if an IF axis is present.
Moved nowhere.
4488. November 3, 1987 UVFLG Bill
Now writes FG table for single-dish, unprojected data.
Moved nowhere.

System and UNIX Changes

4489. October 27, 1987 General Cleanup Kerry
The routines below have only had their typing, documentation or declarations cleaned up. In APLUNIX, the routines changed were:
ZBYMOV ZCH2R4 ZCPU ZDATE ZTIME ZGNAME ZGTBIT
ZPTBIT ZLDFIL ZMATH4 ZTACTQ ZTQSPY
In APLBERK, the routines changed were:
ZTIME ZDATE
In APL4PT2, the routines changed were:
ZABORT
Moved to 15JAN88 the same date.
4490. October 27, 1987 ZDCH.INC in INC Kerry
ZDCH is a new INCLUDE file which both declares and defines in the new common /ZDCHCM/ a number of system "parameters" used in the effort to develop generic Z-routines. This file should *only* be INCLUDED in Z-routines, not any of the machine-independent code. The system parameter variables involved at the moment include those used to map the new flexible file table design (*i.e.*, FTAB array) in the UNIX versions of ZDCHIN (see below). Also, the new system parameter variables NVOLSC (used to implement disks restricted to "scratch" file) as well as SPFRMT and DPFRMT (host single- and double-precision floating-point indicator codes) are declared and defined in /ZDCHCM/. In future releases, new system parameters may be added or old ones may be moved here from the DDCH/CDCH INCLUDE files. Values for the /ZDCHCM/ system parameters are assigned in ZDCHIN.
Moved to 15JAN88 this date.

4491. October 27, 1987

ZDCHIN for UNIX Systems

Kerry

All versions of ZDCHIN in the UNIX Z-routine directories from previous releases have been changed. Previous versions of ZDCHIN for UNIX contained code for the reassignment of messages to a message terminal. This included a call to ZXMSG which is now defunct. Any such reassignment of messages to a different terminal is now handled entirely in the new routine ZTTOPN as called by ZMSGOP (i.e., as part of the opening of message files). More importantly, ZDCHIN has been substantially fortified in an effort to facilitate the development of generic Z-routines. The design of the file control table (i.e., FTAB array) has been made very flexible. In the UNIX versions, the file control blocks for both map and non-map I/O have been increased from 12 to 20 ATPS bytes (per buffer); however, the 4 additional "words" are not yet used. In fact, the UNIX file table design is largely unchanged from previous releases, where it was essentially an imitation of the VMS design. The major difference is the size of the file control blocks and that unused portions of the original design are now being used. For example, the 2nd word is used to store the requested I/O count and the 5th and 6th words are used to store the file size packed in units of 512-byte blocks (good to several hundred gigabytes; see the APLUNIX version of ZDAOPN). The other words are used in the same way as always, which is the same way as for the VMS implementation [i.e., file descriptor/channel (first word), system error code (third word) and transferred I/O count (fourth word)] and will be similarly used in the COS implementation. The definition of the host file table parameters (i.e., file control block sizes, offsets and content) has been removed from all other Z-routines in APLGEN and APLUNIX and is now isolated in ZDCHIN. This is the only place where these variables are assigned values and are passed via the new common /ZDCHCM/ as defined in the new INCLUDE file ZDCH.INC (see above). The intent is to express offsets to FTAB entries throughout the generic Z-routines in terms of these parameters. Some of these are expected to be common to all implementations whereas the flexibility is there for those that need to be implementation specific. ZDCH.INC also defines some new system parameters, including NVOLSC, SPFRMT and DPFRT. NVOLSC is used to implement "scratch" disks (i.e., creation attempts of file types MA and UV are rejected on disk volume numbers NVOLSC and greater of the NVOL disk volumes configured in the host ATPS system; see the new ZCREAT in APLGEN). The default is 99. For example, in the versions of ZDCHIN found in APLVLAC1 and APLNRA01 as used on the NRAO Convexes, we define NVOLSC as 4. NVOL, as set via the program SETPAR, is also 4, which means that, of the 4 disks available, disk number 4 is reserved exclusively for scratch files. If NVOLSC were 3 with NVOL set to 4, disks 3 and 4 would be reserved exclusively for scratch files. NVOLSC should really be set via the program SETPAR (i.e., like NVOL), rather than hard coded in ZDCHIN. The variables SPFRMT and DPFRT are assigned codes indicating the host single- and double-precision floating-point formats (much like BYTFPLP has been used for years to indicate the order of the bytes in the host word). At the moment, SPFRMT and DPFRT are used only in the APLUNIX versions of ZRM2RL and ZDM2DL, but should make their way into other routines in future releases (e.g., ZR32RL, ZRLR32, ZR64RL and ZRLR64). The APLUNIX version of ZDCHIN has values for BYTFPLP, SPFRMT, DPFRT and NVOLSC that represent what we regard as a "canonical" machine (i.e., "standard" byte-ordered words, IEEE floating-point formats and no scratch disks). However, this is a rather dangerous assumption. After all, the only reason that we maintain APL1VAX and APL2VAX versions of ZDCHIN is because installers of ATPS under UNIX on VAX-like architectures have almost invariably failed to set BYTFPLP properly. In future releases, we should probably change this and assign undefined values to these system parameters such that the generic routines which branch on them will always fail with an error message and stop the program, thereby placing the burden on the installer to either properly set these system parameters or write custom code. In any case, for the time being, the new APL1VAX and APL2VAX versions are different from the new APLUNIX version in that, in addition to the BYTFPLP code for the VAX byte order (3), they have the VAX F and VAX G floating-point format codes for SPFRMT and DPFRT, respectively. The new APLALLN and APLCVEX versions differ in that, NWDPL0 is set to "1" since LOGICAL*2 is *not* transformed to simply LOGICAL by the preprocessor on these machines. This difference in NWDPL0 value should disappear once we complete the planned source code conversion to ANSI standard declarations. The new APLCVEX version also differs in that, like the new APL1VAX and APL2VAX versions, it specifies the VAX F and VAX G floating-point formats for SPFRMT and DPFRT, respectively. The new APLNRA01 and APLVLAC1 versions are the same as the APLCVEX version except they both specify the proper NVOLSC value for the NRAO Convexes (as described above). Finally, all the UNIX versions of ZDCHIN call ZDCHI2 (see below) which is used to make many of the system parameters available to the Z-routines written in C through external variables and to determine some of the values for /DCHCOM/ system parameters in a machine-independent way.

Removed APLALLN version of ZXMSG.S (replaced by ZTTOPN as called by ZMSGOP).

Moved to 15JAN88 the same date.

4492. October 27, 1987 . ZDCHI2 for UNIX Systems Kerry

The APLUNIX version of ZDCHI2 is new and should be generic to all UNIX systems, except perhaps on a 64-bit machine where the implementor is determined to use double-precision floating-point (not recommended). ZDCHI2 serves two major purposes in the UNIX implementation. First, its argument list is rather long and includes many of the system parameters which have been assigned values in ZDCHIN (see above). Since it's written in C, values of its arguments can then be assigned to external variables and thereby made available to other C routines. These external variables have names of the form Z_*. For example, the argument value corresponding to BYTFPL as passed to ZDCHI2 from ZDCHIN is assigned to the external variable Z_bytflp. This hopefully will solve the long-term problem of making these system parameters available to C routines in much the same way they have always been available to Fortran routines via /DCHCOM/. The second purpose of ZDCHI2 is that some of the system parameters normally assigned values via hard coded assignment statements in ZDCHIN (which are subject to oversight or misunderstanding) can be assigned proper values in a robust, machine-independent way. This is done by making use of the C sizeof operator and the system constants NBPW (# bytes per word) and NBBY (# bits per byte) as defined in /usr/include/sys/param.h. ZDCHI2 does just this. Comments in the APLUNIX version of ZDCHIN explain which system parameters will actually be assigned values by ZDCHI2. In fact, such system parameters are initialized to "0" in ZDCHIN prior to calling ZDCHI2. At the moment, where Z_nbpwd (i.e., # bytes per "word") is sizeof (short int), the system parameters assigned values in ZDCHI2 include NBITWD (i.e., # bits per "word") as NBBY * Z_nbpwd, NWDPLI (i.e., # "words" per long integer) as sizeof (long int) / Z_nbpwd, NWDPPF (i.e., # "words" per single-precision floating-point) as sizeof (float) / Z_nbpwd and NWDPPD (i.e., # "words" per double-precision floating-point) as sizeof (double) / Z_nbpwd in the case of 64-bit machines (i.e., where sizeof (double) > 8) or sizeof (double) / Z_nbpwd in the case of 32-bit machines. Others could be calculated in future releases. ZDCHI2 also takes this opportunity to calculate other useful system constants that are also made available as external variables. These include Z_nbpab (i.e., # bytes per AIPS byte), Z_nbitab (i.e., # bits per AIPS byte), Z_maskab (i.e., a bit mask for masking off an AIPS byte worth of bits) and Z_nbps (i.e., the number of true bytes per disk sector). Where appropriate, values are expressed in terms of Z_nbpwd so that when we go to 32-bit integers, we need only redefine Z_nbpwd as sizeof (int) and all the UNIX Z-routines should fall in place. Now, if there were just a way to determine the host byte order, radix and floating-point formats in a machine-independent way ...

Moved to 15JAN88 the same date.

4493. October 27, 1987 ZADDR replaces ZXLOC in APLUNIX Kerry

The routine ZXLOC has been renamed to ZADDR in APLUNIX. The calling sequence has not changed, just the name. This routine is designed to return an argument whose value indicates whether or not two input arguments have the same address. This has been useful for turning some Z-routines into null operations on many machines when input and output arrays are the same and no data manipulation is actually required (e.g., ZBYTFL on non-byte-flipped machines). However, the potential for such null operations in AIPS is decreasing.

Removed APLUNIX version of ZXLOC.C (replaced by ZADDR in APLUNIX).

Moved to 15JAN88 same date.

4494. October 27, 1987 ZBYTFL and ZBYTF2 in APLUNIX Kerry

The typing has been cleaned up in both these routines. Calls to ZXLOC have been replaced with calls to ZADDR in ZBYTFL. ZBYTF2 has been changed to issue an error message via ZMSGWR for invalid values of the /DCHCOM/ variable BYTFPL and then to abort the program.

Moved to 15JAN88 same date.

4495. October 27, 1987 ZI16IL, ZI32IL, ZILI16, ZILI32 Kerry

The typing and documentation have been cleaned up in the APLUNIX versions of ZI16IL, ZI32IL, ZILI16 and ZILI32. The use of intrinsic function MAXO has also been replaced with the ANSI generic intrinsic function MAX in ZI32IL. ZI16IL and ZILI16 should be generic to all systems since ZBYTFL is called to perform the actual data conversion, so could be moved to APLGEN. ZI32IL and ZILI32 should be generic to all systems that support INTEGER*2. If a test on NBITWD from /DCHCOM/ were added, these routines could also be moved to APLGEN.

Moved to 15JAN88 the same date.

4496. October 27, 1987 ZI8L8 in APLUNIX Kerry

Cleaned up typing and documentation. The APLUNIX version should be generic to all systems where the local small integer is 16-bits and should probably be moved to APLGEN. A test has been added to check for this condition using NBITWD from /DCHCOM/. If NBITWD is not 16, it will issue an error message to that effect and stop the program. The call to ZXLOC has been changed to a call to ZADDR. The integer constant 2 used as an argument to the intrinsic MOD has been replaced with the properly initialized variable N2 in order to avoid mixed data types in calls to intrinsics.

Moved to 15JAN88 the same date.

4497. October 27, 1987 ZC8CL and ZCLC8 in APLUNIX Kerry
Cleaned up typing. Replaced constants in expressions with the /DCHCOM/ variable #CHPFP. Changed ZXLOC calls to ZADDR calls.
Moved to 15JAN88 the same date.
4498. October 27, 1987 ZGETCH and ZPUTCH in APLUNIX Kerry
The APLUNIX routines ZGETCH (Fortran) and ZGETC2 (C) have been replaced by a version of ZGETCH written entirely in C. Similarly, the routines ZPUTCH (Fortran) and ZPUTC2 (C) have been replaced by a version of ZPUTCH written entirely in C. Whereas the former upper-level Fortran routine plus lower-level C routine combinations allowed for a generic implementation of these routines under UNIX, it also proved prohibitively expensive. However, the new single-level versions written entirely in C, which treat the ichar argument as a pointer instead of a character array, should prove generic to all UNIX systems, regardless of word size, as well as extremely efficient. This is particularly true in AIPS itself as well as tape-oriented tasks (e.g., FITTP, IMLOD and UVLOD) where performance improvements approaching a factor of 2 have been realized.
Removed APLUNIX version of ZGETCH.FOR (replaced by ZGETCH in APLUNIX).
Removed APLUNIX version of ZGETC2.C (replaced by ZGETCH in APLUNIX).
Removed APLUNIX version of ZPUTCH.FOR (replaced by ZPUTCH in APLUNIX).
Removed APLUNIX version of ZPUTC2.C (replaced by ZPUTCH in APLUNIX).
Moved to 15JAN88 the same date.
4499. October 27, 1987 ZGTBYT and ZPTBYT in APLUNIX Kerry
Like ZGETCH and ZPUTCH, the combinations of ZGTBYT (Fortran) plus ZGTBY2 (C) and ZPTBYT (Fortran) plus ZPTBY2 (C) have been replaced by versions of ZGTBYT and ZPTBYT written entirely in C. The layered approach formerly used was intended to facilitate the implementation of generic versions of these routines, but at the expense of efficiency. However, by making use of system constants whose values are calculated or otherwise assigned once in the new routine ZDCHI2 and which are made available as external variables to other routines written in C, it has been possible to write highly generic as well as highly efficient versions of ZGTBYT and ZPTBYT for all UNIX systems, regardless of host word size. They use the system constants Z_bytflp, Z_nbitab and Z_maskab. Z_bytflp is a byte/word flip indicator code (the same value assigned in ZDCHI1 and carried around in the /DCHCOM/) that determines which case of instructions are executed. Z_nbitab is the number of bits per AIPS byte (calculated from the number of bytes per AIPS byte times the number of bits per byte defined in /usr/include/sys/param.h as #BBY), which is used to apply an appropriate bitwise shift to the input argument. Z_maskab is a bit pattern (calculated by taking the complement of zero left shifted Z_nbitab bits), which when used in a bitwise and with an appropriately shifted input argument, yields the desired masked off byte as the output argument. Note: In previous releases where the ZPTBYT/ZPTBY2 combination was used, there was an error in the calling sequence of ZPTBY2 where the input and output arguments were reversed. This has been corrected in the new, non-layered version of ZPTBYT. ZPTBYT is only called by ZI8L8 which is only called by the tasks IMLOD, UVLOD and UVERR, and then only for 8-bit FITS images, which are unusual in the AIPS community (e.g., FITTP does not produce such images).
Removed APLUNIX version of ZGTBYT.FOR (replaced by ZGTBYT in APLUNIX).
Removed APLUNIX version of ZGTBY2.C (replaced by ZGTBYT in APLUNIX).
Removed APLUNIX version of ZPTBYT.FOR (replaced by ZPTBYT in APLUNIX).
Removed APLUNIX version of ZPTBY2.C (replaced by ZPTBYT in APLUNIX).
Moved to 15JAN88 the same date.
4500. October 27, 1987 ZDM2DL in APLUNIX Kerry
ZDM2DL converts Modcomp R*6 (zero padded to R*8) or R*8 data into local equivalent precision. The APLUNIX version can only be regarded as a "conditionally" generic UNIX version. It currently only handles IEEE and VAX G floating-point formats and where the implementation-specific number of words per double precision is twice the number of words per single precision. There is also some question as to the proper value for the IEEE exponent bias, since we don't have an IEEE machine in-house with AIPS on it. In any case, by virtue of the external variables Z_nwdpfp, Z_nwdpdp and Z_dpfrmt which are set in ZDCHI2 or passed to ZDCHI2 from ZDCHI1 (i.e., same as #WDPPP and #WDPPDP in /DCHCOM/ and #DPFRMT in /ZDCHCM/, respectively) and therefore accessible to this C routine, these conditions can be tested. If not true, it issues an error message and aborts the program. ZDM2DL is only used by the task FILLR.
Removed APLCVEX version of ZDM2DL.C (replaced by ZDM2DL in APLUNIX).
Moved to 15JAN88 the same date.

4501. *October 27, 1987* ZMCACL in APLGEN and APLCVEX *Kerry*
ZMCACL converts Modcomp compressed ASCII characters to local uncompressed characters. The APLGEN version of ZMCACL is new and amounts to a stubbed version that issues an error message and then stops the program. The typing has been cleaned up in the APLCVEX Fortran version which should work for any machine supporting the BYTE data type and on which a BYTE variable can be treated as a signed integer (Alliant machines?). A version written in C shouldn't be too difficult and would probably be faster. ZMCACL is only used by the task FILLR.
Removed APLUNIX version of ZMCACL.C (replaced by stubbed ZMCACL in APLGEN).
Moved to 15JAN88 the same date.
4502. *October 27, 1987* ZRDMF in APLGEN and APLUNIX *Kerry*
ZRDMF converts data packed in DEC-Magtape format (DMF) to pairs of 16-bit integers (i.e., 1 per local integer). The APLGEN version is new and amounts to a stubbed version that issues an error message to this effect, then stops the program. The APLUNIX version was formerly the APLCVEX version only with some typing cleanup. It should be generic to all UNIX systems that allow 16-bit integers and similar to the APLGEN version, it makes use of Z_nbitwd as determined from ZDCHI2 to enforce this. ZRDMF is only used by the task FILLR.
Removed APLCVEX version of ZRDMF.C (replaced by ZRDMF in APLUNIX).
Moved to 15JAN88 the same date.
4503. *October 27, 1987* ZRM2RL in APLUNIX *Kerry*
ZRM2RL converts Modcomp single-precision floating-point data into local single-precision floating-point. The APLUNIX version can only be regarded as a "conditionally" generic UNIX version. It currently only handles IEEE and VAX F floating-point formats. There is also some question as to the proper value for the IEEE exponent bias, since we don't have an IEEE machine in-house with ATPS on it. In any case, by virtue of the external variable Z_dpfmt, whose value is passed to ZDCHI2 from ZDCHIN (i.e., the same as SPFRMT in /ZDCHCM/) and thereby made available to routines written in C, the host single-precision floating-point format can be tested. If not true, it issues an error message and aborts the program. ZRM2RL is used only by the task FILLR.
Removed APLCVEX version of ZRM2RL.C (replaced by ZRM2RL in APLUNIX).
Moved to 15JAN88 the same date.
4504. *October 27, 1987* File Locking for UNIX *Kerry*
ZLOCK is a new routine that will attempt to apply either an exclusive or shared non-blocking lock on a specified file (opened or unopened). File locking under UNIX is only advisory, not mandatory. That is, locks are meaningful only on a cooperative basis. Programs are not obliged to honor locks applied by other programs, or to even check for them. The major differences between the APLSYS5 version of ZLOCK and the APL4PT2 version arise from the different implementation schemes for locking files under Bell System V (lockf) versus Berkeley 4.2 (flock) UNIX systems. Bell System V 2.0 does not support the notion of "shared" locks, so the APLSYS5 version applies an exclusive lock in all cases. For machines with System V 2.0+, we could probably use fcntl with F_SETLK and F_WRLCK to implement exclusive locks and F_SETLK and F_RDLCK to implement shared locks. In any case, since we don't have an ATPS installed on a Bell UNIX system in-house, the APLSYS5 version may be suspect. However, some simple experiments conducted on one of the NRAO Greenbank Masscomps suggested that it might actually work.
Moved to 15JAN88 the same date.
4505. *October 27, 1987* ZERROR in APLGEN and APLVMS *Kerry*
A new argument was added to the APLGEN version of ZERROR to indicate whether the I/O involved was map (double-buffered) or non-map (single-buffered) I/O. When ZERROR is called to process map I/O errors, it is not always known which of the two buffers is involved (e.g., after calls to ZDAOPN or ZDACLS). So, for map I/O errors, ZERROR attempts to interpret the system error code from both file control blocks and the contents of both blocks are also dumped. The file control block sizes are known by virtue of the new ZDCHIN parameterization of the file table (i.e., FTAB) design which is passed via /ZDCHCM/ (as defined in ZDCH.INC). The old APLGEN version of ZERROR was moved to APLVMS because the calls to ZERROR in the VMS-specific routines don't include the new argument and the offset to the file control block in FTAB is hard coded.
Moved to 15JAN88 the same date.
4506. *October 27, 1987* Generic ZEXIST *Kerry*
The APLGEN version of ZEXIST is new and should be generic over a wide range of systems. Its calling sequence has not changed. It calls ZEXIS2 to actually test for the existence of the specified file and return its size. ZEXIST calls ZERROR to process errors returned from ZEXIS2.
Removed APLALLN version of ZEXIST.FOR (replaced by ZEXIST in APLGEN).
Removed APLUNIX version of ZEXIST.FOR (replaced by ZEXIST in APLGEN).
Moved to 15JAN88 the same date.

4507. October 27, 1987

ZEXIS2 for UNIX

Kerry

The APLUNIX version of ZEXIS2 is new and should be generic to all UNIX systems. It's only called by ZEXIST to actually perform the test for the existence of the specified file and return its size. ZEXIS2 was formerly called ZXXIST in the UNIX implementation and still performs the same function, however the calling sequence is different. It translates the logical device associated with the specified "physical" file name using ZTRLOG, forms the fully qualified file name, opens the file and if it exists, obtains the file size via stat. It returns the file size in *ATPS* bytes by virtue of knowing the number of "true" bytes per *ATPS* byte as calculated in ZDCHI2 and assigned to the external variable Z_nbpab. Therefore, the APLUNIX version should be generic to all UNIX systems, regardless of word size.

Removed APLALLN version of ZXXIST.C (replaced by ZEXIS2 in APLUNIX).

Removed APLUNIX version of ZXXIST.C (replaced by ZEXIS2 in APLUNIX).

Moved to 15JAN88 the same date.

4508. October 27, 1987

Generic ZCREAT

Kerry

The APLGEN version of ZCREAT is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls the lower-level routine ZCREA2 to perform the actual file creation and allocate the requested disk space. ZCREA2 was formerly known as ZQCREA (a name referring to VMS QIO) and its calling sequence is also different. ZCREAT calls ZERROR to process errors returned from ZCREA2. The concept of purely scratch volumes has been implemented in ZCREAT using the /ZDCHCM/ variable NVOLSC as set in ZDCHIN. The notion is that file types UV and MA are not allowed on volumes NVOLSC through NVOL. Scratch volumes have proven particularly useful on the NRAO Convexes and it is highly desirable to restrict the use of devices like an SSD on Cray X-MPs to scratch files. It may be that NVOLSC should be in /DCHCOM/ instead. It should almost certainly be tunable via SETPAR so that the addition of more disk volumes (scratch or otherwise) doesn't require the recompilation and/or relinkage of so many *ATPS* programs.

Removed APLNRA01 version of ZCREAT.FOR (replaced by ZCREAT in APLGEN).

Removed APLUNIX version of ZCREAT.FOR (replaced by ZCREAT in APLGEN).

Removed APLVLAC1 version of ZCREAT.FOR (replaced by ZCREAT in APLGEN).

Moved to 15JAN88 the same date.

4509. October 27, 1987

ZCREA2 in APLUNIX

Kerry

The APLUNIX version of ZCREA2 is a new and should be generic to all UNIX systems. In previous releases, ZCREA2 was known as ZQCREA and has a different calling sequence. ZCREA2 passes the requested and actual file size in *ATPS* bytes and also has a system error code argument. ZQCREA used to use `access` (to test for file pre-existence) and `create` (to actually create the desired file). ZCREA2 uses `open` with `flags` `O_CREAT` (create if file does not exist), `O_EXCL` (error if file exists) and `O_WRONLY` (open for writing only). The mode argument is 666 (*i.e.*, owner, group and world readable and writable) to facilitate running *ATPS* from private accounts. However, this will *not* override the user's default file creation mask `umask`. This should be set prior to execution in `$$SYSLOCAL/ASSNLOCAL.SH`. There is still no way to allocate disk space under UNIX other than to write the entire file with something. ZCREA2 does this just as ZQCREA used to, however, it attempts to make it an atomic process, at least as far as *ATPS* execution is concerned. It first creates (if necessary) and attempts to lock the file `SPACE` in the appropriate data area. If unsuccessful after 30 attempts at 2 second intervals, it will issue an error message and return with the appropriate error code. All of this is to avoid two or more *ATPS* processes from converging on the same free space and perhaps failing when there is in fact enough free space for at least one of them to run.

Removed APLALLN version of ZQCREA.C (replaced by ZCREA2 in APLUNIX).

Removed APLNRA01 version of ZQCREA.C (replaced by ZCREA2 in APLUNIX).

Removed APLUNIX version of ZQCREA.C (replaced by ZCREA2 in APLUNIX).

Removed APLVLAC1 version of ZQCREA.C (replaced by ZCREA2 in APLUNIX).

Removed APLUNIX, APLNRA01 and APLVLAC1 versions of ZCREA3.FOR as well as APLUNIX, APLALLN, APLNRA01 and APLVLAC1 versions of ZQCRE3.C (defunct).

Moved to 15JAN88 the same date.

4510. October 27, 1987

Generic ZEXPND

Kerry

The APLGEN version of ZEXPND is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZEXPND2 to perform the actual file expansion (*i.e.*, increase its size) which is still restricted to non-map files.

Removed APLUNIX version of ZEXPND.FOR (replaced by ZEXPND in APLGEN).

Moved to 15JAN88 the same date.

4511. October 27, 1987

ZEXPN2 for UNIX

Kerry

The APLUNIX version of ZEXPN2 is new and should be generic to all UNIX systems. It's called by both ZEXPND and ZMSGXP to perform the actual expansion (*i.e.*, increase the size) of an open file. File expansion is still restricted to non-map files. In previous releases, ZEXPN2 was known as ZQEXP, a name referring to VMS QIO. It allocates a temporary I/O buffer of size 256 times `Z_nbpwd` (*i.e.*, number of bytes per word) bytes for use in the file expansion (disk space cannot be allocated under UNIX except by writing at the end of the file). `Z_nbpwd` is an external variable whose value is assigned in `ZDCHI2` via `sizeof` (`short int`), so the APLUNIX version of ZEXPN2 should be generic to all UNIX systems, regardless of word size. The increased size of the file is obtained via a call to `fstat` and the file size as stored in the file control block by `ZDAOPI` is updated, regardless of any write errors that may have been encountered (*e.g.*, disk space exhaustion). This is also true for the ZEXPN2 return argument giving the integer number of 256 word records by which the file was expanded.

Removed APLUNIX version of `ZQEXP.C` (replaced by ZEXPN2 in APLUNIX).
Moved to 15JAN88 the same date.

4512. October 27, 1987

Generic ZOPEN

Kerry

The APLGEN version of ZOPEN is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. The opening of Tektronix-like devices and text files has been eliminated (see `ZTKOPN` and `ZTOPEN`). The opening of TV devices had been eliminated in the 15MAR84 release and the opening of tape devices had been eliminated in the 15APR87 release. ZOPEN is now limited to the opening of map and non-map disk files, the control terminal and the line printer via calls to the lower-level routines `ZDAOPI`, `ZTTOPN` and `ZLPOPNI`, respectively. Error processing is handled via calls to `ZERROR`. The opening of Tektronix-like devices has been moved to `ZTKOP2` as called by `ZTKOPN`. The opening of text files is now handled entirely in `ZTOPEN`. However, this may also be layered in the future to handle the special needs of text files opened for writing.

Removed APLALLN version of `ZOPEN.FOR` (replaced by ZOPEN in APLGEN).
Removed APLBERK version of `ZOPEN.FOR` (replaced by ZOPEN in APLGEN).
Removed APLCVEX version of `ZOPEN.FOR` (replaced by ZOPEN in APLGEN).
Removed APLUNIX version of `ZOPEN.FOR` (replaced by ZOPEN in APLGEN).
Moved to 15JAN88 the same date.

4513. October 27, 1987

ZDAOPI in APLUNIX

Kerry

`ZDAOPI` is the replacement for the routine formerly known as `ZQOPEN` (a name referring to VMS QIO). Its sole purpose is to open map and non-map disk files. It translates a "physical" file name as returned by `ZPHFIL` into the corresponding fully qualified file name on the host, opens the file, then calls `ZLOCK` to apply either a shared or exclusive non-blocking lock, depending on how `ZDAOPI` was called. The file size is recorded in `FTAB` which is used later to prevent reading, and in particular, writing beyond the EOF (this is not illegal under UNIX, but is a violation of the *ATPS* system interface design). In the case of "map" I/O, it will dup the file descriptor for use with the second I/O buffer. The hooks are there for asynchronous I/O, but in the APLUNIX version (*i.e.*, generic UNIX) the standard UNIX synchronous I/O is assumed. My first attempt at implementing Convex's asynchronous I/O uncovered a bug that may have been fixed in version 6.0 of their operating system. Measurements of I/O throughput show that there is little to gain by using asynchronous I/O on Convex striped file systems (*e.g.*, like NRAO's systems); however, it would probably substantially improve wall clock performance on non-striped file systems. There *may* be an advantage on Convex striped file systems as well if *ATPS* ever requests transfers larger than the current limit of 16 kilobytes.

Removed APLUNIX version of `ZQOPEN.C` (replaced by ZDAOPI in APLUNIX).
Removed APLALLN version of `ZQOPEN.C` (replaced by ZDAOPI in APLUNIX).
Removed APLCVEX version of `ZDAOPI.C` (asynchronous disk I/O didn't work reliably under Convex OS 4.3).
Moved to 15JAN88 the same date.

4514. October 27, 1987

ZTTOPN and ZTTOP2 in APLCVEX

Kerry

Due to what I believe is a Convex bug, the APLCVEX version of `ZTTOPN` cannot close unit 5 and reopen it in order to make it both readable and writable. At least the last time I tried this, the last input read was displayed on the terminal at the end of the next write. So in the APLCVEX version, `ZTTOPN` leaves unit 5 alone, but this means that output intended for unit 5 must be forced to unit 6. This can be rather confusing to users who expect it to come out on their input terminal (*i.e.*, as they may have become used to on non-Convex systems for tasks with `DOCRT=TRUE`). Of course, this confusion only arises where a dedicated message terminal is configured for *POPS* number "*n*". The APLCVEX version also calls a lower-level routine, `ZTTOP2`, which only exists in APLCVEX. The purpose of `ZTTOP2` is to reassign unit 6 to a dedicated message terminal which is usually a terminal that has been removed from the interactive group, a notion that presents its own peculiar problems (see the source code for `ZTTOP2` in APLCVEX regarding the setting of the terminal baud rates).

Moved to 15JAN88 the same date.

4515. October 27, 1987

ZTTOPN and ZTTCLS for UNIX

Kerry

ZTTOPN and ZTTCLS are new routines designed to isolate the opening and closing of the input and message terminals (i.e., units 5 and 6, respectively). This was formerly done directly in ZOPEN and ZCLOSE for the input terminal and in ZMSGOP and ZMSGCL for the message terminal. Because the requirements for doing this varied so much from system to system (even for UNIX), it made it impossible to make ZOPEN, ZCLOSE, ZMSGOP and ZMSGCL generic. ZOPEN and ZMSGOP now call ZTTOPN to open these terminals and ZCLOSE and ZMSGCL call ZTTCLS to close them. ZTTOPN should probably also be the place where batch error output is reassigned to the logical device BATCH_OUT, but this has not been implemented yet in any of the current versions. The APLUNIX version of ZTTOPN should be generic to all UNIX systems (Convex being a notable exception). Unit 5 corresponds to stdout under UNIX and by default is open for reading only. The first time the APLUNIX version of ZTTOPN is called for unit 5, it is first closed, then opened again which should make it both readable and writable. When called for unit 6, the logical device corresponding to the message terminal for the current POPS number is translated via a call to ZTRLOG and if different from the default output terminal, unit 6 is closed and reopened on the proper message terminal device. Otherwise, unit 6 is never actually closed or opened since this is not necessary under UNIX. In fact, the first call to ZTTOPN for either unit number is the only one in which anything is actually done (if successful). The local LOGICAL variables OPEN5 and OPEN6 are DATA initialized to FALSE. After the unit "n" is "opened", the variable OPENn is set to TRUE and thereafter, ZTTOPN simply returns whenever called again for unit "n". This eliminates the overhead associated with the incessant opening and closing of these terminals, something that is not really necessary under UNIX. For this reason the APLUNIX version of ZTTCLS is a null routine (i.e., all required opens and closes are handled in ZTTOPN). Moved to 15JAN88 the same date.

4516. October 27, 1987

Generic and UNIX-specific ZTTYIO

Kerry

The APLGEN version of ZTTYIO is new. Its calling sequence has *not* changed. It calls CHPACK on the I/O buffer after reads and CHXPND on the I/O buffer before writes, so in this sense, it should be generic to all systems regardless of host word size. However, for various other reasons there is a significant chance that the APLGEN version of ZTTYIO will work not on many systems. Some systems require carriage control on output, others don't. The APLGEN version assumes that carriage control is required whereas the APLBERK version assumes that it is not required. Bell UNIX convention is not clear. Some Bell UNIX systems seem to require carriage control (at least our dated experience under Masscomp's System 3 UNIX did). The APLMASC version also includes a ":" edit descriptor to terminate format control when the I/O list is exhausted. Either or both of these considerations may or may not still be required on Masscomps. To confuse the issue, our dated experience under Amdahl's implementation of Bell version 7 UNIX (i.e., UTS) did not require carriage control and we have had reports from other sites to support this as the Bell UNIX convention. The typing and documentation for all of the above versions has been cleaned up. They all also make use of the logical unit number as passed by the calling routine, except for the APLCVEX version which forces all WRITES to unit 6. This is due to the problem with closing and reopening unit 5 to be both readable and writable (see the entry for the APLCVEX version of ZTTOPN).

Removed APLALLN version of ZTTYIO.FOR (replaced by ZTTYIO in APLBERK).

Removed APLUNIX version of ZTTYIO.FOR (replaced by ZTTYIO in APLGEN).

Moved to 15JAN88 the same date.

4517. October 27, 1987

Generic ZFI3 and ZFIO

Kerry

The APLGEN versions of ZFI3 and ZFIO are new and should be generic over a wide range of systems. Their calling sequence has *not* changed. They are restricted to non-map I/O transfers between memory and disk or Tektronix-like devices. The transfers are actually performed by calls to the lower-level routines ZFI2 (disk) and ZTKFI2 (Tektronix-like). ZERROR is called to process errors returned by ZFI2 or ZTKFI2. The use of ZFI3 or ZFIO for Tektronix-like devices may be replaced in future releases by ZTKFIO, a routine that does not exist at the moment and that would require changes to the machine-independent code.

Removed APLUNIX version of ZFI3.FOR (replaced by ZFI3 in APLGEN).

Removed APLUNIX version of ZFIO.FOR (replaced by ZFIO in APLGEN).

Moved to 15JAN88 the same date.

4518. October 27, 1987

Generic ZMI3 and ZMIO

Kerry

The APLGEN versions of ZMI3 and ZMIO are new and should be generic over a wide range of systems. Their calling sequences have *not* changed. They are restricted to map I/O transfers between memory and disk. The transfers are actually performed by calls to the lower-level routine ZMI2. ZERROR is called to process errors returned by ZMI2.

Removed APLUNIX version of ZMI3.FOR (replaced by ZMI3 in APLGEN).

Removed APLUNIX version of ZMIO.FOR (replaced by ZMIO in APLGEN).

Moved to 15JAN88 the same date.

4519. October 27, 1987

Generic ZWAIT

Kerry

The APLGEN version of ZWAIT is new and should be generic over a wide range of systems. Its calling sequence has not changed. It calls ZWAI2, which was known as ZQWIO in previous versions, to perform any actual wait servicing for map I/O (i.e., on systems where asynchronous disk I/O is implemented). The calling sequence is the same as for the old ZQWIO routine. ZWAIT calls ZERROR to process any system errors returned by ZWAI2.

Removed APLUNIX version of ZWAIT.FOR (replaced by ZWAIT in APLGEN).

Moved to 15JAN88 the same date.

4520. October 27, 1987

ZFI2 for UNIX

Kerry

The APLUNIX version of ZFI2 is new and should be generic to all UNIX systems. ZFI2 replaces the routine ZQIO (a name referring to VMS QIO) which was previously used for both map and non-map disk I/O (the new routine ZMI2 replaces ZQIO for map disk I/O transfers; see entry for ZMI3, ZMIO and ZMI2). This presumed that the same I/O technique could be used for both, which is not necessarily true (e.g., the Modcomp and COS implementations of AIPS). The AIPS definition of a non-map disk transfer is a single 256-word record. ZFI2 makes use of the external variable Z_nbpwd (number of bytes per word) as determined in ZDCHI2 to calculate the number of bytes in a 256-word record and therefore the number of bytes to transfer as well as the byte offset in file from whence to start the transfer. The value of Z_nbpwd is assigned in ZDCHI2 in terms of sizeof (short int), so the APLUNIX version of ZFI2 should be generic to all UNIX systems, regardless of word size. The position of the last byte requested is checked against the size of the file which is stored in the file control block by ZDAOPN (or updated by ZEXP2 after a file expansion). A request to write beyond the end of file is treated as an error (faked as EINVAL). This is not an error under UNIX; however, it is a violation of the AIPS system interface design.

Removed APLUNIX version of ZQIO.C (replaced by ZFI2 and ZMI2 in APLUNIX).

Moved to 15JAN88 the same date.

4521. October 27, 1987

ZMI2 for UNIX

Kerry

ZMI2 is a new routine that replaces the routine ZQIO (a name referring to VMS QIO) which was previously used for both map and non-map disk I/O (the new routine ZFI2 replaces ZQIO for non-map disk I/O transfers; see entry for ZFI3, ZFIO and ZFI2). This presumed that the same I/O technique could be used for both. The transfer count passed to ZMI2 is in units of AIPS bytes starting at a given "virtual" block number. Virtual block sizes are defined in terms of AIPS bytes in ZDCHIN and assigned to the /DCHCOM/ variable NBPS. NBPS is also passed to ZDCHI2 which converts NBPS to true bytes and makes this value available to routines written in C as the external variable Z_nbps. ZMI2 uses Z_nbps to calculate the offset in the file where the transfer is to start. ZMI2 also makes use of the ZDCHI2 defined external integer Z_nbpab (number of bytes per AIPS byte) to convert the transfer count between AIPS bytes and true bytes. Z_nbps and Z_nbpab are defined in ZDCHI2 in terms of sizeof (short int), so the APLUNIX version of ZMI2 should be generic to all UNIX systems, regardless of host word size. The position of the last byte requested is checked against the size of the file which is stored in the file control block by ZDAOPN. A request to write beyond the end of file is treated as an error (faked as EINVAL). This is not an error under UNIX, however, it is a violation of the AIPS system interface design.

Moved to 15JAN88 the same date.

4522. October 27, 1987

ZWAI2 for UNIX

Kerry

The APLUNIX version of ZWAI2 is new and should be generic to all UNIX systems using synchronous disk I/O. It is called only by ZWAIT and it replaces the routine formerly known as ZQWIO (a name referring to VMS QIO). The APLUNIX version of ZWAI2 assumes that asynchronous I/O is not implemented because most UNIX systems do not offer it. Therefore, it simply returns immediately after checking for I/O errors. Convex systems have asynchronous I/O; however, our last experience with it resulted in execution errors that seemed to be data set-dependent. Our experience involved the task UVSRT and was only discovered after asynchronous I/O had been in place for quite a while. For this reason, the APLCVEX versions of ZDAOPN and ZWAI2 using asynchronous I/O have been withheld from the 15OCT87 release. In the case of AIPS user data areas on Convex striped file systems, asynchronous I/O has little if any performance advantage, but would probably improve wall clock performance substantially on systems limited to regular file systems. As time permits, we will pursue the issue for future releases. The UNIX installation tape for 15OCT87 actually contains the versions of ZDAOPN and ZWAI2 where Convex asynchronous I/O is implemented. These are the files ZDAOPN.ASIO and ZWAI2.ASIO in APLCVEX. Convex sites are free to play with these if they like, but beware that asynchronous I/O may not perform consistently.

Removed APLUNIX version of ZQWIO.C (replaced by ZWAI2 in APLUNIX).

Moved to 15JAN88 the same date.

4523. October 27, 1987

Generic ZCLOSE

Kerry

The APLGEN version of ZCLOSE is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. The closing of TV devices, Tektronix-like devices and text files has been eliminated just as tape closing was eliminated in the 15APR87 release. It is now limited to the closing of map and non-map disk files, the control terminal and the line printer via calls to the lower-level routines ZDACL5, ZTTCLS and ZLPCLS, respectively. System error returns are processed via calls to ZERROR. Where Z-routines are required, the closing of TV devices is now handled via calls to lower-level routines from the upper-level Z-routine appropriate to the device involved (*e.g.*, ZM7OCL calls ZM7OC2 to close an IIS Model 70 device). Similarly, the closing of Tektronix-like devices has been moved to ZTKCL2 as called by ZTKCLS. The closing of text files is now handled entirely in ZTCLOS, however, this may also be layered in the future to handle the closing and disposition of text files opened for writing.

Removed APLALLN version of ZCLOSE.FOR (replaced by ZCLOSE in APLGEN).

Removed APLBERK version of ZCLOSE.FOR (replaced by ZCLOSE in APLGEN).

Removed APLUNIX version of ZCLOSE.FOR (replaced by ZCLOSE in APLGEN).

Moved to 15JAN88 the same date.

4524. October 27, 1987

ZDACL5 in APLUNIX

Kerry

ZDACL5 is the replacement for the routine formerly known as ZQCLOS. Its sole purpose is to close map and non-map disk files opened by ZDAOPN.

Removed APLUNIX version of ZQCLOS.C (replaced by ZDACL5 in APLUNIX).

Moved to 15JAN88 the same date.

4525. October 27, 1987

Generic ZMSG* routines

Kerry

The APLGEN versions of ZMSGOP, ZMSGXP, ZMSGDK and ZMSGCL are new and should be generic over a wide range of systems. Their calling sequences have *not* changed. These versions **INCLUDE** the file ZDCH.INC which makes available the file control block sizes and offsets defined in ZDCHIN. Like the APLGEN version of ZOPEN, ZMSGOP calls ZDAOPN to actually open the disk message file. It also calls ZTTOPN to open the terminal message file since this is likely to be different from system to system. ZERROR is called to process system error returns from ZDAOPN. Like the APLGEN version of ZEXPND, ZMSGXP calls ZEXPN2 to perform the actual message file expansion. ZEXPN2 has been carefully coded not to call MSGWRT in order to avoid recursion. ZMSGDK calls ZFI2 to perform the actual I/O between memory and the disk message file. ZERROR is called to process system errors returned from ZFI2. Like the APLGEN version of ZCLOSE, ZMSGCL calls ZDACL5 to actually close the disk message file. It also calls ZTTCLS to actually close the terminal message file since this will likely have different requirements on different systems. The APLUNIX version of ZMSGWR has been moved to APLGEN. It's designed to simplify message handling from Z-routines not written in Fortran, but may not be needed under many implementations.

Removed APLUNIX version of ZMSGOP.FOR (replaced by ZMSGOP in APLGEN).

Removed APLUNIX version of ZMSGXP.FOR (replaced by ZMSGXP in APLGEN).

Removed APLUNIX version of ZQMSGX.C (replaced by ZEXPN2 in APLUNIX).

Removed APLUNIX version of ZMSGDK.FOR (replaced by ZMSGDK in APLGEN).

Removed APLUNIX version of ZMSGCL.FOR (replaced by ZMSGCL in APLGEN).

Removed APLUNIX version of ZMSGWR.FOR (replaced by ZMSGWR in APLGEN).

Moved to 15JAN88 the same date.

4526. October 27, 1987

Line Printer Routines

Kerry

in APLGEN, APLUNIX and APLALLN: ZLPOPn, ZLPCLS and ZLPCL2 are new routines designed to isolated the opening, closing and disposition of line printer files since this is likely to have different requirements under different operating systems. ZLPOPn is called only by ZOPEN where line printer files were formerly opened. ZLPOPn simply determines the unique name of a temporary disk file and opens it. It calls ZXMKTM to generate a unique file name. The version of ZLPOPn in APLUNIX should be generic to all UNIX systems and could be generic to all systems, provided a suitable version of ZXMKTM is developed. Since the calling sequence of ZXMKTM has not been fixed up to pass the length of its CHARACTER argument explicitly, an APLALLN-specific version of ZLPOPn is required. ZXMKTM will be renamed in a future release to eliminate the reference to UNIX (*i.e.*, ZX*). Under UNIX, the unique temporary file name generated is of the form /tmp/ZLPCL2.XXXXXX where XXXXXX is unique. Similarly, ZLPCLS is called only by ZCLOSE where line printer files used to be closed. ZLPCLS determines the name of the temporary disk file via an INQUIRE on UNIT=1, then calls ZLPCL2 to actually dispose this file to the line printer and delete it. ZLPCLS calls ZERROR to process errors returned from ZLPCL2.

Removed APLALLN version of ZLPRC.C (replaced by ZLPCL2 in APLUNIX).

Removed APLUNIX version of ZLPRC.C (replaced by ZLPCL2 in APLUNIX).

Moved to 15JAN88 the same date.

4527. October 27, 1987 ZLPCL2 Shell Script for UNIX Kerry
Under UNIX, the routine ZLPCL2 invokes a locally developed shell script designed to spool the temporary disk file to the line printer. The shell script must also be called ZLPCL2 and should reside in SYSLOCAL. In previous releases, both the subroutine ZLPCL2 and the shell script ZLPCL2 were known under the name ZLPR2, but were renamed to conform to the new naming convention. A critical difference is that the shell script ZLPCL2 should *not* delete the file. The routine ZLPCL2 will delete it.
Moved to 15JAN88 the same date.
4528. October 27, 1987 ZENDPG in APLGEN and APLUNIX Kerry
The purpose of this routine is to advance the line printer to avoid "burn-out" on electro-static type line printers. All line printer-oriented verbs and tasks call it. Unfortunately, what happens on your printer depends on how you code this routine. In the generic version, we assume a form feed is desired. In the APLUNIX version, we assume a form feed is not desired because many ATPS sites use laser printers for both their printing and plotting. The notion is to avoid the unnecessary blank pages on laser printers that some sites keep bitching about. ZENDPG should probably be entirely eliminated and its function incorporated into the ZLPCL2, but ZLPCL2 would somehow have to know about the number of lines printed on the current page (*i.e.*, the only argument to ZENDPG).
Moved to 15JAN88 the same date.
4529. October 27, 1987 Generic ZRENAM Kerry
The APLGEN version of ZRENAM is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZRENA2 to perform the actual file renaming.
Removed APLUNIX version of ZRENAM.FOR (replaced by ZRENAM in APLGEN).
Moved to 15JAN88 the same date.
4530. October 27, 1987 ZRENA2 for UNIX Kerry
The APLUNIX version of ZRENA2 is new and should be generic to all UNIX systems. It's called only by ZRENAM to perform the actual file renaming. In previous releases, ZRENA2 was known as ZQRENA (a name referring to VMS QIO). The calling sequence has not changed, just the name. It calls ZTRLOG to translate the logical device associated with the "physical" old file name and desired new file name to form full path names. The old file is open'ed and locked for exclusive use via a call to ZLOCK. A link is formed between the old path name and the new path name, then the old path name is unlink'ed to complete the renaming process, followed by a call to sync to update the superblock as soon as possible. Finally the file is close'd, which unlocks the file. ZERROR is called to process system error returns from open, link and unlink.
Removed APLALLN version of ZQRENA.C (replaced by ZRENA2 in APLUNIX).
Removed APLUNIX version of ZQRENA.C (replaced by ZRENA2 in APLUNIX).
Moved to 15JAN88 the same date.
4531. October 27, 1987 Generic ZDESTR Kerry
The APLGEN version of ZDESTR is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZDEST2 to perform the actual "destruction" of the specified file.
Removed APLALLN version of ZDESTR.C (replaced by ZDESTR in APLGEN).
Removed APLUNIX version of ZDESTR.C (replaced by ZDESTR in APLGEN).
Moved to 15JAN88 the same date.
4532. October 27, 1987 ZDEST2 for UNIX Kerry
The APLUNIX version of ZDEST2 is new and should be generic to all UNIX systems. It's called only by ZDESTR and its role is to perform the actual "destruction" of the specified file. ZDEST2 calls ZTRLOG to translate the logical device name associated with the "physical" file name provided by ZDESTR, builds the fully qualified file name, opens the file, attempts to lock it for exclusive use via a call to ZLOCK and if successful, deletes it and then closes the file which frees up the disk space. ZERROR is called by ZDEST2 to process any open or close errors. This should probably be moved to ZDESTR.
Moved to 15JAN88 the same date.
4533. October 27, 1987 Generic ZM70OP Kerry
The APLGEN version of ZM70OP is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZM70O2 to perform the actual open of an IIS model 70 TV device. ZERROR is called to process errors returned from ZM70O2.
Removed APLCVEX version of ZM70OP.FOR (replaced by ZM70OP in APLGEN).
Removed APLUNIX version of ZM70OP.FOR (replaced by ZM70OP in APLGEN).
Moved to 15JAN88 the same date.

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4534. *October 27, 1987* ZM7002 in APLUNIX *Kerry*
ZM7002 is a new routine. The APLUNIX version should be generic to all UNIX systems. It translates the logical TV device name and performs a non-map (*i.e.*, single-buffered I/O) open on the physical device.
Moved to 15JAN88 this date.
4535. *October 27, 1987* Generic ZM70MC *Kerry*
The APLGEN version of ZM70MC is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZM70M2 to perform the actual master clear on an IIS model 70 TV device. The calling sequence of ZM70M2 has been changed to include an error return argument. ZERROR is called by ZM70MC to process errors returned from ZM70M2.
Removed APLUNIX version of ZM70MC.FOR (replaced by ZM70MC in APLGEN).
Moved to 15JAN88 the same date.
4536. *October 27, 1987* ZM70M2 in APLUNIX and APLCVEX *Kerry*
The calling sequence of ZM70M2 has been changed to include an error return argument. The proper `ioctl` master clear request needed for ZM70M2 will be system dependent. The APLCVEX version of ZM70M2 is Convex specific. The APLUNIX version is the same as the APLCVEX version, only stubbed with an error message regarding the need for local development, and returns a suitable error code. This should ultimately be replaced by a Fortran version in APLGEN.
Removed APLUNIX version of ZM70MC.FOR (replaced by ZM70MC in APLGEN).
Moved to 15JAN88 the same date.
4537. *October 27, 1987* Generic ZM70XF *Kerry*
The APLGEN version of ZM70XF is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZM70X2 to perform the actual transfer of data between memory and an IIS model 70 TV device using non-map I/O (*i.e.*, single-buffered I/O). The call to ZQMSG has been replaced by a call to ZERROR to process errors returned from ZM70X2.
Removed APLUNIX version of ZM70XF.FOR (replaced by ZM70XF in APLGEN).
Moved to 15JAN88 the same date.
4538. *October 27, 1987* ZM70X2 for UNIX *Kerry*
The APLUNIX version of ZM70X2 is new and should be generic to all UNIX systems. This routine was formerly called ZTVQIO under the UNIX implementation in previous releases. The calling sequence of ZM70X2 is also different from ZTVQIO. Its role is to perform the actual transfer of data between memory and an IIS model 70 TV device using non-map I/O (*i.e.*, single-buffered I/O).
Removed APLUNIX version of ZTVQIO.C (replaced by ZM70X2 in APLUNIX).
Moved to 15JAN88 the same date.
4539. *October 27, 1987* Generic ZM70CL *Kerry*
The APLGEN version of ZM70CL is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. It calls ZM70C2 to perform the actual close of an IIS model 70 TV device. ZERROR is called to process errors returned from ZM70C2.
Removed APLUNIX version of ZM70CL.FOR (replaced by ZM70CL in APLGEN).
Moved to 15JAN88 the same date.
4540. *October 27, 1987* ZM70C2 for UNIX *Kerry*
The APLUNIX version of ZM70C2 is new and should be generic to all UNIX systems. Its role is to perform the actual close of an IIS model 70 TV device. It's called only by ZM70CL.
Moved to 15JAN88 the same date.
4541. *October 27, 1987* ZIVSOP in APLUNIX *Kerry*
Replaced call to ZXITLOG with call to ZTRLG.
Moved to 15JAN88 the same date.
4542. *October 27, 1987* ZDEAOP and ZDEAXF in APLUNIX *Kerry*
Cleaned up typing. INCLUDED ZDCH.INC plus removed declaration and initialization of MOFF and NMOFF. Otherwise, the APLUNIX versions of these routines are still null routines pending development (we know of no DeAnza implementations under UNIX).
Moved to 15JAN88 the same date.

4543. October 27, 1987

ZDOPRT in APLUNIX

Kerry

ZDOPRT is used only by the task PRTPPL and has never been developed for the UNIX implementation since we have never had a suitable printer/plotter device attached to any in-house *AIPS* system running under UNIX. Actually, NRAO1 can get to the Versatec on CVAX, so time permitting, we may be able to develop a working ZDOPRT. However, the APLUNIX version is currently stubbed and issues an error message to that effect, then returns with an error. This stubbed version should probably be moved to APLGEN. The APLUNIX routines ZDOPR2, ZDOPR3 and ZDOPR4 in previous releases were just variations on ZDOPRT for different makes and models of printer/plotter devices and were also stubbed pending development. These routines are never called by name. As an imitation of the VMS implementation, they were intended only as alternative code to be substituted as the local version of ZDOPRT. However, these, too, had never been developed for UNIX and have therefore been deleted.

Removed APLUNIX version of ZDOPR2 (never developed for UNIX).

Removed APLUNIX version of ZDOPR3 (never developed for UNIX).

Removed APLUNIX version of ZQIOV (only referenced by defunct ZDOPR3).

Removed APLUNIX version of ZDOPR4 (never developed for UNIX).

Moved to 15JAN88 the same date.

4544. October 27, 1987

Software tape mounts under UNIX

Kerry

The typing and documentation have been cleaned up in the APLUNIX version of ZMOUNT. ZMOUNT calls ZMOUN2 to actually perform software mount requests for tapes. ZMOUN2 was formerly known as ZXMOUN under the UNIX implementation, but has been renamed to conform with the new Z-routine naming convention. The calling sequence has not changed, just the name.

Removed APLUNIX version of ZXMOUN.C (replaced by ZMOUN2 in APLUNIX).

Removed APLUTS version of ZXMOUN.C (replaced by ZMOUN2 in APLUTS).

Removed APLMASC version of ZXMOUN.C (replaced by ZMOUN2 in APLMASC).

Removed APLCVEX version of ZXMOUN.C (replaced by ZMOUN2 in APLCVEX).

Moved to 15JAN88 the same date.

4545. October 27, 1987

Tape manipulation under UNIX

Kerry

The APLUNIX version of ZTAPE has been changed to call ZTAP2 instead of ZQTAPE. ZTAP2 was formerly known as ZQTAPE (a name referring to VMS QIO) under the UNIX implementation, but has been renamed to conform with the new Z-routine naming convention. All UNIX versions of ZQTAPE from previous releases have been renamed to ZTAP2. The calling sequence has not changed, just the name. Asynchronous I/O has been implemented for tape I/O on Convex systems (see ZTPMI2 and ZTPWA2 in APLCVEX). The version of ZTAP2 found in APLCVEX is specific to Convex systems for the usual reasons (*e.g.*, tape controller-specific status bits), but also because it always calls the Convex-specific asynchronous I/O wait service function *asiostat* (on both buffers). Otherwise, the byte count as returned by *asiostat* after subsequent tape I/O (*i.e.*, in the APLCVEX version of ZTPWA2) is contaminated with an additional 512 bytes for each tape manipulation (*e.g.*, a rewind).

Removed APLUNIX version of ZQTAPE (replaced by ZTAP2 in APLUNIX).

Removed APLMASC version of ZQTAPE (replaced by ZTAP2 in APLMASC).

Removed APLUTS version of ZQTAPE (replaced by ZTAP2 in APLUTS).

Removed APL1VAX version of ZQTAPE (replaced by ZTAP2 in APL1VAX).

Removed APLALLN version of ZQTAPE (replaced by ZTAP2 in APLALLN).

Removed APLCVEX version of ZQTAPE (replaced by ZTAP2 in APLCVEX).

Removed APLSUN version of ZQTAPE (replaced by ZTAP2 in APLSUN).

Removed APL2VAX version of ZQTAPE (replaced by ZTAP2 in APL2VAX).

Moved to 15JAN88 the same date.

4546. October 27, 1987

ZTPOPN in APLGEN, APLVMS, APLCVEX

Kerry

The APLGEN version of ZTPOPN has been changed to INCLUDE the file ZDCH.INC containing the COMMON definition of /ZDCHCM/ which includes the variables MOFF and NMOFF (the offsets to map and non-map entries in FTAB) whose values are assigned in the APLUNIX version of ZDCHIN. The declarations and DATA initializations of MOFF and NMOFF have been removed from ZTPOPN. The calls to ZERROR have been changed to reflect the new map I/O indicator argument. The previous APLGEN version of ZTPOPN was moved to APLVMS until the APLVMS version of ZDCHIN can be made more like the APLUNIX version. The APLCVEX version of ZTPOPN differs from the APLGEN version only in that it performs tape manipulation after opening the tape. This has been necessary on Convex systems because Convex has insisted on writing logical ends of tape on tapes opened for writing, regardless of whether any writing was done. In Convex's OS 6.0, a *sysgen* parameter is available to turn this behavior off. This has yet to be tested on the NRAO Convexes, but if it proves robust, the APLCVEX version of ZTPOPN will be replaced by the APLGEN version. However, this presumes that all Convex sites have enabled this *sysgen* parameter (groan!).

Moved to 15JAN88 the same date.

4553. *October 27, 1987* ZTPMID in APLGEN and APLVMS *Kerry*
The APLGEN version of ZTPMID has been changed to INCLUDE the file ZDCH.INC containing the COMMON definition of /ZDCHCM/ which includes the sizes of map and non-map file control blocks and offsets to their entries. These values are assigned in the APLUNIX version of ZDCHIN. The APLGEN version currently doesn't make use of these when storing values in the file control block, but should. The offsets are currently hard coded, which means that the APLGEN version of ZTPMID is generic only to the UNIX and VMS implementations (or any implementation that imitates the UNIX or VMS file control block design). Also, an attempt probably should be made to process non-zero IOSTAT values from the Fortran READ and WRITE via a call to ZERROR, but is not at the moment. Instead, they are simply assigned to the ZTPMID error return argument for processing in the calling routine. The previous APLGEN version of ZTPMID was moved to APLVMS until APLVMS version of ZDCHIN can be made more like the APLUNIX version. Moved to 15JAN88 the same date.
4554. *October 27, 1987* ZTPWAD in APLGEN and APLCVEX *Kerry*
The APLGEN version of ZTPWAD is new and amounts to a stubbed version that issues an error message to that effect with a suitable error return. It will require local development since it depends on the local IOSTAT return value as stored in the file control block after each READ or WRITE in ZTPMID. The IOSTAT error code required is the one indicating end-of-file on direct access files. Since IOSTAT error codes are system specific, there can be no truly generic Fortran version of this routine. The APLCVEX version of ZTPWAD contains the required IOSTAT value suitable for Convex Fortran. It has been changed to be like the APLGEN version in that it INCLUDES the file ZDCH.INC where FCBERR is declared and defined in the common /ZDCHCM/. FCBERR is the offset to the file control block entry for system error codes and is defined in the APLUNIX version of ZDCHIN. The IOSTAT error code is now extracted from the file control block using FCBERR instead of a hard coded offset.
Removed APLUNIX version of ZTPWAD.FOR (replaced by stubbed ZTPWAD in APLGEN).
Moved to 15JAN88 the same date.
4555. *October 27, 1987* ZTPCLS in APLGEN and APLVMS *Kerry*
The APLGEN version of ZTPCLS has been changed to INCLUDE the file ZDCH.INC containing the COMMON definition of /ZDCHCM/ which includes the variables MOFF and NMOFF (the offsets to map and non-map entries in FTAB) whose values are assigned in the APLUNIX version of ZDCHIN. The declarations and DATA initializations of MOFF and NMOFF have been removed from ZTPCLS. The calls to ZERROR have been changed to reflect the new map I/O indicator argument. The previous APLGEN version of ZTPCLS was moved to APLVMS until APLVMS version of ZDCHIN can be made more like the APLUNIX version.
Moved to 15JAN88 the same date.
4556. *October 27, 1987* ZTPCL2 in APLUNIX *Kerry*
The APLUNIX version of ZTPCL2 has been modified to make use of offsets to file control block entries as defined in ZDCHIN. These offsets are passed from ZDCHIN to ZDCHI2 in the APLUNIX version and made available to routines written in C as external variables (i.e., Z_fcber is the offset to the file control block entry where system error codes are to be stored). The APLUNIX version of ZTPCL2 should be generic to all UNIX systems.
Moved to 15JAN88 the same date.
4557. *October 27, 1987* ZTPCLD in APLGEN and APLVMS *Kerry*
The APLGEN version of ZTPCLD has been changed to INCLUDE the file ZDCH.INC containing the COMMON definition of /ZDCHCM/ which includes the variable FCBERR (the offset to map and non-map entries in FTAB for storing system error codes) whose value is assigned in the APLUNIX version of ZDCHIN. The IOSTAT return value from the Fortran CLOSE is now stored in the file control block at the appropriate offset defined by FCBERR. An attempt should probably be made to process non-zero FCBERR values via a call to ZERROR, but is not at the moment. Instead, they are simply assigned to the ZTPCLD error return argument for processing in the calling routine. The previous APLGEN version of ZTPCLD was moved to APLVMS until APLVMS version of ZDCHIN can be made more like the APLUNIX version.
Moved to 15JAN88 the same date.
4558. *October 6, 1987* ZQMSCL Shell Script under UNIX *Kerry*
After implementing the ability to specify output files in the ZQMSIO and ZQMSCL routines, the shell script ZQMSCL, which is invoked by the routine ZQMSCL to actually spool the output file to the laser printer, has been changed to not delete the file. The deletion of the output file after printing (if called for) is now done in the routine ZQMSCL. This change was made in the SYSUNIX, SYSVLAC1 and SYSWRA01 versions of the script. These versions now also contain documentation to aid in the development of local versions, something that will almost certainly be required.
Moved to 15JAN88 the same date.

4559. October 27, 1987

ZQMSIO and ZQMSCL in APLUNIX

Kerry

The typing and documentation for the APLUNIX versions of ZQMSIO and ZQMSCL have been cleaned up. The former calls to ZXTLOG have been replaced with calls to ZTRLOG. The former inability to specify an output file has been implemented by testing for a non-blank output file name (i.e., non-blank value for the adverb OUTFILE), however, since UNIX does not have version numbers, it refuses to overwrite a file that already exists under the output file name. The directory for the output file is assumed to be /tmp unless a VMS-style file name is given including a logical name for the directory (e.g., MYDIR:QMSPL.OUT). If so, it calls ZTRLOG to translate the logical directory name and appends the file name to it to form the full path name. If no output file is specified, a temporary path name of the form /tmp/ZQMSCL.XXXXXX is generated via a call to ZXMKTM, where XXXXXX is unique. Such files are automatically deleted after having been spooled to the laser printer. ZQMSIO calls ZQMSCL to perform the actual spooling of the file and deletion if necessary. The calling sequence to ZQMSCL has been changed to include explicit length arguments for the CHARACTER arguments being passed as well as a file deletion indicator. ZQMSIO passes "1" as the deletion indicator for cases where the output file is blank and ZQMSCL will delete the file after spooling it to the laser printer. Otherwise, the output file is simply spooled to the laser printer. The subroutine ZQMSCL invokes a shell script, also called ZQMSCL, to perform the actual file spooling. The ZQMSCL shell script requires local development and should reside in SYSLCAL. Extant ZQMSCL shell scripts should be modified to remove the file deletion since this is now handled by the subroutine ZQMSCL depending on the value of the file deletion indicator as passed from ZQMSIO. ZQMSIO calls ZERROR to process non-zero IOSTAT return values from OPEN, WRITE, INQUIRE, and CLOSE, and system error returns from ZQMSCL. Removed APLALLN version of ZQMSIO (replaced by ZQMSIO in APLUNIX). Moved to 15JAN88 the same date.

4560. October 27, 1987

Text file routines

Kerry

The APLGEN versions of ZTREAD and ZTCLOS are new and should be generic over a wide range of systems. ZTREAD calls CHPACK to pack the card image read into a REAL*4 array which allows the same FORMAT statements to be used regardless of host word size. Unlike previous versions, where ZTCLOS would simply call ZCLOSE, the actual closing of the text file and the deallocation of the associated file table entry has been coded directly in ZTCLOS. The APLUNIX version of ZTOPEN has been almost entirely re-written and should be generic to all UNIX systems. It no longer calls ZOPEN to allocate a file table entry or ZCLOSE (on error) to deallocate the file table entry prior to returning. Instead, the file table entry allocation/deallocation formerly used in ZOPEN/ZCLOSE has been migrated to ZTOPEN itself. The call to ZXTLOG to translate RUNSYS in the case of RUN files has been replaced with a call to ZTRLOG. The in-line construction of the UNIX-specific full path name for RUNSYS files is the only thing that prevents the APLUNIX version from being generic to a wider range of systems.

Removed APLALLN version of ZTOPEN.FOR (replaced by ZTOPEN in APLUNIX).

Removed APLUNIX version of ZTREAD.FOR (replaced by ZTREAD in APLGEN).

Removed APLUNIX version of ZTCLOS.FOR (replaced by ZTCLOS in APLGEN).

Moved to 15JAN88 the same date.

4561. October 27, 1987

ZTXMAT and ZTXMA2 for UNIX

Kerry

The typing and documentation has been cleaned up in the APLUNIX version of ZTXMAT. The call to ZXTLOG has been replaced with a call to ZTRLOG (i.e., for translating the "logical" RUNSYS). The in-line construction of the UNIX-specific full path name for RUNSYS files is the only thing that prevents the APLUNIX version from being generic to a wider range of systems. ZTXMAT calls ZTXMA2 to actually extract a list of files from the specified directory that match the wild card file name specification. In previous releases, ZTXMA2 was known as ZPARS. In addition to being renamed, the calling sequence to ZTXMA2 is different from that of the old ZPARS. Apart from its name and calling sequence, the APLUNIX version of ZTXMA2 is essentially the same as the routine formerly known as ZPARS. It assumes the Bell UNIX and pre-Berkeley 4.2 UNIX directory structure, so it should be generic to these UNIX systems. Likewise, the APL4PT2 version of ZTXMA2 is very similar to what was previously known as ZPARS; however, it has been enhanced to compile a regular expression via re_comp and calls regex to extract its list of matching file names. This was largely motivated by the use of the EDT editor on the VLA Convex (CHOLLA) which preserves one level of backup with a file name of the form "*.*.bak". ZPARS would then find two files that matched the wild card file specification and AIPS would complain about the ambiguity. The original ZPARS algorithm could have been patched up to avoid this problem, but by implementing file name matches based on a regular expression, I believe that ZTXMA2 is both more efficient and completely foolproof. I would have implemented the same regular expression technique in the APLUNIX version, but the implementation of the same regular expression technique under Bell UNIX is substantially different and we don't have AIPS running on a Bell UNIX system at NRAO. Perhaps a stand-alone test can be done, but contributed code from a Bell UNIX site would also be nice.

Removed APLALLN version of ZTXMAT.FOR (replaced by ZTXMAT in APLUNIX).

Removed APLUNIX version of ZPARS.C (replaced by ZTXMA2 in APLUNIX).

Removed APL4PT2 version of ZPARS.C (replaced by ZTXMA2 in APL4PT2).

Removed APLALLN version of ZPARS.C (replaced by ZTXMA2 in APL4PT2).

Moved to 15JAN88 the same date.

4562. October 27, 1987 ZDIR in APLUNIX Kerry
Cleaned up the typing and redeclared FILE from CHARACTER*9 to CHARACTER*(*) since it's a ZDIR argument.
Moved to 15JAN88 the same date.

4563. October 27, 1987 Generic ZTKOPN Kerry
The APLGEN version of ZTKOPN is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. Unlike previous versions, it no longer calls ZOPEN which formerly took care of inputs checking, allocating and deallocating (*i.e.*, on error) the file table entry and then called ZQASSN to perform the actual opening of the specified Tektronix-like device. Instead, all such former ZOPEN actions have now been incorporated directly in ZTKOPN, except it calls the new routine ZTKOP2 to perform the actual opening of the device instead of ZQASSN. If ZTKOP2 returns an error indicating that the desired device is busy, ZTKOPN will wait 2 seconds and try again up to 150 times (*i.e.*, for 5 minutes) issuing a message every 15th attempt (*i.e.*, 30 seconds) before giving up. System errors returned from ZTKOP2 are processed via a call to ZERROR.
Removed APLUNIX version of ZTKOPN.FOR (replaced by ZTKOPN in APLGEN).
Moved to 15JAN88 the same date.

4564. October 27, 1987 ZTKOP2 for UNIX Kerry
The APLUNIX version of ZTKOP2 is new and *may* be generic to a wide range of UNIX systems and Tektronix-like devices. It calls ZTRLOG to translate the logical device name for the desired device, tests for its existence and attempts to write-enable it via chmod. This is attempted whether necessary or not in case the device is a slave pseudo terminal (*i.e.*, /dev/ttyp*), for example, a SUN `tektools` window. Chmod errors are ignored. It then attempts to open the device read/write. If it's busy, ZTKOP2 returns with an error code indicating so. If the target device is *not* the same as control tty (*i.e.*, the user is not running in AIPS REMOTE mode), ZTKOP2 will take exclusive use of the successfully opened terminal. If the target device *is* the same as the control tty, "raw" mode is enabled via calls to `ioctl` so the terminal can handle Tektronix graphics output. It should be noted that if the target device is not in the interactive group (*i.e.*, is a dedicated device not used for logins), `init` never gets a chance to set its baud rate. Our Convexes assume 9600 baud in this case, independent of the true baud rate for the line. Other systems probably do the same and I know of know way to determine the true baud rate. The simple solution is to make these terminal line involved 9600 baud. The more complicated solution is to develop the code in ZTKOP2 that can somehow fill in the true baud rate. All of the above is the lowest common denominator solution derived from in-house experiments on our Convexes using a variety of Tektronix and Tektronix-like output devices. These include real Tektronix 4010s and 4012s, Tektronix emulations on a Modgraph terminal, a Visual 102 terminal, a Selenar terminal, a Compact PC and remote logins via telnet from CVAX using many of the same devices as well as from a SUN `tektools` window. The bottom line is that not all emulators and terminal drivers are created equal, and may therefore require special coding.
Removed APLUNIX, APLUTS, APLALLN and APLCVEX versions of ZQASSN.C (replaced by Z*02 open routines for TV devices, ZTKOP2 for Tektronix-like devices and ZTPOP2 for tape devices in APLUNIX and APLCVEX).
Moved to 15JAN88 the same date.

4565. October 27, 1987 Generic ZTKBUF Kerry
The APLGEN version of ZTKBUF is new and should be generic over a wide range of systems. Its calling sequence has *not* changed. ZTKBUF did not require any substantial changes to be made generic and is essentially the same as the old APLUNIX version with some typing and documentation cleanup.
Removed APLUNIX version of ZTKBUF.FOR (replaced by ZTKBUF in APLGEN).
Moved to 15JAN88 the same date.

4566. October 27, 1987 ZTKFI2 for UNIX Kerry
The APLUNIX version of ZTKFI2 is new and should be generic to all UNIX systems. In previous releases, ZTKFI2 was known as ZTKQIO (a name referring to VMS QIO). In addition to the name change, the calling sequence of ZTKFI2 is different from the old ZTKQIO (*i.e.*, the "wait" argument has been eliminated). Some Tektronix-like devices may require different setups for reading as opposed to writing. ZTKFI2 is called only by ZFIO and ZFI3. The use of ZFI3 or ZFIO for Tektronix-like devices may be replaced in future releases by ZTKFIO, a routine that does not exist at the moment; this would require changes to the machine-independent code.
Removed APLUNIX version of ZTKQIO.C (replaced by ZTKFI2 in APLUNIX).
Moved to 15JAN88 the same date.

4574. *October 27, 1987* ZDELAY and ZDELA2 for UNIX *Kerry*
The typing and documentation have been cleaned up in ZDELAY and all UNIX versions of ZDELA2. ZDELAY is highly generic and should ultimately be moved to APLGEN. It calls ZDELA2 to perform the actual requested execution delay. The APLUNIX version of ZDELA2 is generic to all UNIX system;, however it uses sleep to induce the delay which has a time resolution of 1 second at best. The APL4PT2 version of ZDELA2 is generic to all 4.2 bsd UNIX systems and uses setitimer to achieve 10 millisecond resolution. During the original port of *ATPS* to Alliant machines, I discovered that using either the C functions sleep or setitimer caused execution errors claiming an attempt to perform concurrent I/O. The APLALLN version of ZDELA2 uses the Fortran callable SLEEP which did not have this problem. However, like the C sleep, it only has 1 second resolution at best. Has anyone tried the APL4PT2 version on his or her Alliant and does it still cause problems?
Moved to 15JAN88 the same date.
4575. *October 27, 1987* ZCPU in APL4PT2 *Kerry*
Now uses getrusage (4.2 bsd specific) to obtain the cpu time in addition to the I/O count. I know of no way to obtain I/O statistics under Bell UNIX. Even the I/O statistics returned by getrusage can be difficult to interpret since block sizes can be different from file system to file system, caching mechanisms can distort the true block count and the daemon is charged for asynchronous I/O implemented via daemon processes (e.g., Convex).
Moved to 15JAN88 the same date.
4576. *October 27, 1987* ZFREE in APLUNIX *Kerry*
Cleaned up the typing in the APLUNIX version of ZFREE and eliminated the unused array intended for reporting the number of open files on each disk volume. There is no way to determine the number of open files on a given volume under UNIX or COS. Since this is expected in the VMS version of ZFREE, it may not be possible to agree on a generic form. ZFREE calls ZFRE2 to perform the actual interrogation of the system regarding free disk space. Removed APLALLN version of ZFREE.FOR (replaced by ZFREE in APLUNIX).
Moved to 15JAN88 the same date.
4577. *October 27, 1987* ZFRE2 for UNIX *Kerry*
In the UNIX Z-routine directories, ZFRE2 was formerly known as ZXFREE in previous releases, but has been renamed to conform with the new Z-routine naming convention. In addition to the name, the calling sequence of ZFRE2 is different from the old ZXFREE in that lengths of CHARACTER arguments are now explicitly passed. ZFRE2 is called only by ZFREE to actually interrogate the system regarding free disk space. Under UNIX, this is done by parsing the output of the UNIX command df. The output format of df varies from system to system so it is difficult to write a version of ZFRE2 that is generic to all UNIX systems.
Removed APLALLN version of ZFREE.FOR (replaced by ZFREE in APLUNIX).
Removed APLALLN version of ZXFREE.C (replaced by ZFRE2 in APLUNIX).
Removed APLMASC version of ZXFREE.C (replaced by ZFRE2 in APLMASC).
Removed APLUNIX version of ZXFREE.C (replaced by ZFRE2 in APLUNIX).
Removed APLUTS version of ZXFREE.C (replaced by ZFRE2 in APLUNIX).
Moved to 15JAN88 the same date.
4578. *October 27, 1987* ZKDUMP in APLUNIX *Kerry*
Cleaned up typing and documentation. Changed the output format slightly to insure blank space between fields. The APLUNIX version calls ZXHEX to translate a decimal value to its hexadecimal representation as a hollerith string. ZXHEX should renamed to eliminate the reference to UNIX (i.e., ZX*) and developed for other systems so that this version of ZKDUMP can be generic to all systems.
Moved to 15JAN88 the same date.
4579. *October 27, 1987* Defunct UNIX Z-routines *Kerry*
The following defunct UNIX Z-routines have been eliminated including the APLUNIX routines ZEDIT (used once upon a time by the now defunct task REDIT), ZEXIT (no longer used and may never have been), and ZX2I16 (only developed for UNIX implementations as a temporary measure against the use of Z format specifiers which had crept into some critical modules and which have since been eliminated, hopefully never to reappear). The APLUNIX routines ZQWKPR and ZSBIT have also been eliminated. These routines are called only by the VMS-specific program QWKPL and are therefore not supported as part of the UNIX implementation at the moment. QWKPL is a "quick" version of PRTPL which resides in APGVMS. Sites that wish to try installing QWKPL must therefore develop these two routines locally. The APLUNIX versions of these routines in previous releases had never been developed beyond stubbed form anyway, so they have been eliminated to dispell any illusions that they are required. At least for the UNIX implementation, all references to ZQMSG and ZQDEVN have been replaced by the new ZERROR/ZERRO2 combination. Therefore, ZQMSG and ZQDEVN have been eliminated from all the UNIX Z-routine directories. The routine ZGTDIR is not used in the UNIX implementation anymore, so it has also been eliminated from all the UNIX Z-routine directories.
Moved to 15JAN88 the same date.

4580. October 27, 1987

ZABOR2 script in SYSUNIX

Kerry

At some point, the Z-routine for UNIX systems, called ZXSIGC, was renamed to ZABOR2. It invokes an identically named shell script that attempts to preserve the core file induced by a subsequent call to abort in the \$ERRORS directory to facilitate post mortem debugging. When ZXSIGC was renamed, the name of the shell script it invoked was also changed in the code, but I failed to rename the shell script itself and the preservation of core files quit working. The SYSUNIX script formerly named ZXSIGC has now been properly renamed to ZABOR2 and the preservation of core files should be restored.
Moved to 15JAN88 the same date.

4581. October 26, 1987

Miscellaneous SYSUNIX Changes

Kerry

Fixed an error in the description of the "logical" YV20 in the AREAS.* files found in SYSUNIX, SYSNRA01 and SYSVLAC1. Fixed a problem with log file deletion in the compilation procedures AS, CC and FC as found in SYSUNIX as well as FC as found in SYSNRA01 and SYSVLAC1. A problem has also been fixed with the DEBUG option in all versions of FC. Increased the size of the internal file variable INTFIL from 132 to 256 characters in the sed script INTFIL.SED as found in SYSUNIX. INTFIL.SED is used to preprocess ENCODE/DECODE statements into Fortran internal WRITE/READ constructs. The required maximum was formerly 132, but the task LWLPA exceeded this.
Moved to 15JAN88 same date.

4582. October 26, 1987

Options for Convex fc 3.0

Kerry

Converted old fc 2.2 syntax to new fc 3.0 syntax in FCOPTS.SH and LDOPTS.SH as found in SYSCVEX, SYSNRA01 and SYSVLAC1.
Moved to 15JAN88 same date.

4583. October 26, 1987

FC, OPT2.LIS, KC and FSC

Kerry

The SYSNRA01 and SYSVLAC1 versions of FC differ from the SYSUNIX version in that the file OPT2.LIS as stored in SYSLOCAL, which contains a manually maintained list of module names, is used to select O2 level optimization on these modules instead of the normal optimization level (i.e., 00). The versions of OPT2.LIS in SYSNRA01 and SYSVLAC1, which are identical, have been changed to include all the Q-routines (except QVTRAN because O2 optimization under fc 3.0 on this module produces execution errors) as well as PLNPUT and ZBYTFL. The SYSNRA01 and SYSVLA1 versions of FC also differ in that when a compilation fails, it invokes the KC (kludge compile) script to try to circumvent certain internal compiler errors, which are recognized by the text of their error messages. These internal compiler errors persist under fc 3.0; however, their error messages are different from fc 2.2. The KC script has been modified to recognize the new messages. The work-around for these internal compiler errors involves several steps. The source code module is subjected to fsplit, which separates all program units into different files. These are individually compiled and the resultant object modules are then combined via ld into a single object module. FSC is a new script which is much like the FC/KC combination, except it's designed to perform the fsplit compilation technique of KC without first letting fc fail. It's therefore faster to use FSC than FC if it is known a priori that fc will fail on a given module due to one of the recognizable internal compiler errors mentioned above. The SYSNRA01 and SYSVLAC1 versions of FC, OPT2.LIS, KC and FSC should be identical and should apply to all Convex sites. Other Convex sites should copy them from either SYSNRA01 or SYSVLAC1 to their own SYSLOCAL. Perhaps we should move them to SYSCVEX and add the SYSCVEX directory to the execution search path for Convex sites.
Moved to 15JAN88 same date.

4584. October 26, 1987

Miscellaneous System Changes for Convex

Kerry

The output format has been changed for the SPACE script that determines disk space usage on the NRAO Convexes. Calls to ZXFRE and ZXTLOG in the program SPACE have been replaced with calls to ZFRE2 and ZTRLOG, respectively. The SYSNRA01 version of the AIPSS startup script has been changed to issue a warning about known IVAS problems if TV #2 is selected. The definitions of RESST1 and RESST2 have been swapped in the SYSVLAC1 version of ASSNLOCAL.SH. AIPSTT1 has also been redefined to be the same as RESST1 since the message terminal has been eliminated from the AIPSS1 station on the VLA Convex C1. DACK is a new shell script found in SYSNRA01 and SYSVLAC1 which attempts to perform a file system consistency check on the AIPSS notion of a file system (i.e., the DAO* areas). It detects cases of orphaned files and suggests corrective action. It cannot detect corruptions in catalog files (i.e., CA* files). The task DISKU with USERID=32000 is a good way to expose these. In the SYSVLAC1 versions of ASOPTS.SH, CCOPTS.SH, FCOPTS.SH, INCS.SH, LDOPTS.SH and PP, the comment stating that these are NRAO-CV Convex versions has been changed to properly specify that these are the NRAO-VLA Convex versions, even though they are identical in many cases.
Moved to 15JAN88 same date.

4585. October 26, 1987

ZLPCL2 Shell Script for Convex

Kerry

The *SYSNRA01* and *SYSVLAC1* versions of *ZXPRT* have been renamed to *ZLPCL2*, better documented and otherwise modified for use with the identically named routine, *ZLPCL2*. The *SYSVLAC1* version spools line printer files to a QMS laser printer via *lpr*. The *SYSNRA01* version attempts to spool the line printer file to the Versatec printer on *CVAX* via *ftp* a maximum of 3 times, after which it spools it to a QMS laser printer via *lpr* just as in the *SYSVLAC1* version. As prescribed, neither the *SYSNRA01* nor *SYSVLAC1* versions delete the line printer file. This action is now handled instead by the routine *ZLPCL2*.

Moved to 15JAN88 same date.

15-October-1987 Statistics

From the *EXPFIT* program come the following statistics selected releases:

	15APR86	15OCT86	15JAN87	15APR87	15OCT87
Number of directories	51	74	79	79	85
Number of text files	2,788	3,188	3,331	3,448	3,577
Number of text lines	457,373	512,935	559,445	607,108	619,800
Number of bytes in compressed form	15,051,843	16,839,059	18,336,530	19,899,828	20,229,072

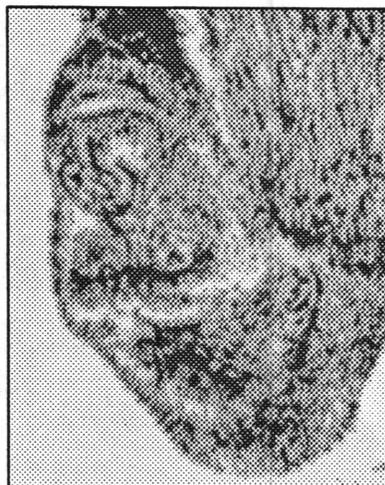
From the *WHOGETS.ADR* file come the following statistics:

Number of contact persons	147	165	174	197
Number of <i>AIPSE</i> LETTER recipients	720	735	759	339

Note that there were 458 people who did not renew their *AIPSE* LETTER subscriptions.



October 15, 1987



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