AIPS MEMO NO. 21

AIPS WISHLIST

Version 1.0
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REVIEW and SUMMARY

The AIPS wishlist has been divided into four main parts:
(1) Bugs and improvements in existing software
(2) Desired new software development
(3) Documentation improvement
(4) System software development

The list has been compiled from many discussions and memos over the past year. The priorities; H=high, M=medium, L=low, have been assigned for each entry. These priorities are tentative and a major part of the discussion on Wednesday Nov. 10 will be to rearrange these priorities and add additional items. Items with H priority should be done as quickly as possible. Those with M priority should be done if time permits and they are relatively easy. Items with L priority should be ignored for the most part. The effort in man-days has been estimated for many of the entries; some values may be in serious error.

There are about 18 items with high priority in the existing software section which have been given high priority. By and large these items are considered the most important of those bugs which are now affecting AIPS. Much of the inputs for these items have come from the Wednesday gripe sessions and the formal gripe files. Rearrangement of the priorities and additions should be discussed.

There are only four high priority items in the new software catagory. The most important item is that of spectral line development. The development is multi-faceted and Walter Jaffe made a good start in trying to organize the effort. He, alas, has gone to Baltimore.

Several points are clear, however.

(1) The person or persons developing the software should spend a majority of time in Charlottesville. This means that the burden will most likely fall on Eric Greisen. This also means that many of the AIPS details now handled by Eric will have to be curtailed and/or handled by others in the group.

(2) Several pieces of mapplane software are available now (TRANS, MOMNT, SMOTH, SLICE) as well as relevant 'continuum' software. Additional tasks needed should be guided by the GYPSY package, wishlists from several NRAO people and include;

a. frequency/velocity/pixel conversion routines
   additional header information and some restructuring
b. automatic/interactive general windowing routine
c. a good transpose subroutine
d. several multi-dimensional convolution programs
e. Gaussian fits of slices after windowing
f. creating an image from a set of slices or fits to slices
g. rotation of cube around axis perpendicular to x-y axis
h. development of color displays

(3) The u-v software (mapping, cleaning, selfcal) exists in AIPS. There are gross inconveniences caused by the DEC-10 export format

but little effort should be made here because of the imminent pipeline development.

(4) Interface of pipeline u-v data format and AIPS u-v data format. While it is hoped that most of the mapping, cleaning and self-cal of spectral line data will be done in the pipeline, easy and accurate transferral of u-v data and relevant parameters to AIPS must be made.

The most important improvements in documentation are, I think, associated with the cookbook, whatsnew and use of disks. It is important to have the documentation as current as possible and as easy to use as possible for the average user. Other documentation problems are also listed.

The list of AIPS system changes contains many items which would take a large effort. These generally have low or medium priority and would not be considered until AIPS goes through a major rewrite. The high priority items are those being driven by spectral line software or by efforts which are already underway. The AIPS group has generally given higher priority to those items which are truly a nuisance for the user as contrasted to those items which are long term investments in AIPS.

EXISTING SOFTWARE: BUGS AND IMPROVEMENTS

TASK or VERB	PRIO	EST. DAYS	PROBLEM
APCLN	H	1	Hogs the AP at the VLA site.
	H	>10	32767 iteration limit a nuisance. Could concatenate list to decrease number of components.
	M	2	Beam fitting algorithm is still imperfect.
	L	10	Display clean search area using graphics plane on the TV. See Blotch region--new software.
	M	10	Use clean components from one map to clean another map or cube of maps.
APMAP	L	>30	Support APMAP as the one-step mapping program.
ASCAL	L	10	Make a restartable program so long jobs can be done in segments. Could be done by adding time range option in ASCAL and gain table concatenation.
	H	10	Put more statistics in program; egs, rms of fit, bad correlators.
	M	3	Put gain plotting option back in ASCAL.
	M	4	Fix amplitude normalization of Gain solution or take it out.
ASCOR	M	3	May have some bugs remaining.
AVFILE	L	2	Make a task version for long executions.
AVMAP	L	2	Make a task version for long executions.
AXDEFINE	L	2	Add rotation of axis entry as an option.

BATCH	H	2	Batch rarely works at the VLA site. Probably, some of the initialized parms are incorrect.
CLRSTAT	H	1	Clear all READ and WRIT statuses with one execution.
CNTR	M	4	Option to plot clean beam ellipse.
	M	5	Option to place crossed at specified points.
COMB	M	5	Put in rotation measure and intrinsic angle.
	M	15	Incorporate CORMS task into COMB.
	H	2	Task should operate on any plane in a cube.
CORER	L	10	Basic UV statistics program. Enlarge capability.
DISKUSE	H	5	Somewhat unreliable and slow. Replace by or incorporate VAX utility routines.
EXTDEST	H	1	Delete highest version number if INVERS=0.
FITTP	L	5	Writing of clean components takes a lot of tape and a lot of time.
	M	5	Handle floating point inputs images.
GNPLT	H	5	Needs work on several small bugs and problems. Some basic plots should be put back into ASCAL.
GREYS	M	5	Include TV look-up table before executing. Also try to speed up execution.
HELP	H	3	Automatic paging of listing on terminal.
	M	3	Hard copy listing on terminal from AIPS.
IMFIT	H	10	Restructure program to meet standards.
	H	3	Fix several bugs and clean-up options.
IMHEADER	M	3	More flexible selection of output.
IMLOD	H	5	Much too slow in execution.
INPUTS	H	3	Automatic paging of listing on terminal.
	M	3	Hard copy listing on terminal from AIPS.
MOMFT	M	3	Is this a useful program? Omit if not.
NTERP	M	10	Make a reliable program or omit in AIPS.
PCNTR	M	4	Option to plot clean beam ellipse.
	M	5	Option to place crossed at specified locations.
PROFL	L	3	Need option for flat geometry plot.
PRTMSG	H	4	Print out specified messages accordings to AIPS # and task or verb name.
	M	3	The message log is a nuisance. Be able to turn it off.
PRTPL	M	5	Print n copies of output with one execution.
TPHEAD	H	5	List previous mapname, class, seq no, if available.
TVLOD	M	5	Have blanked pixels displayed with 0 intensity. Other levels scaled from 1 to 255.
TVPSEUDO	M	3	Make colors more "IMPS-like".

UVEXP	H	3	Have a DOALL option to write many sources.
UVLOD	H	5	Have a DOALL option to load many sources.
	M	1	Specified output name should include seq. #.
UVMAP	M	3	For spectral line map generation, usually done with STOKES 'RL', do not use RMAP and LMAP as default class but increment seq #.
UVPLT	M	5	Useful program. Can it be speeded up?

NEW SOFTWARE

TYPE	PRIO	EST. DAYS	DESCRIPTION
SPEC. LINE	H	100	Several important tasks and verbs to improve the spectral line capability. See introduction.
HEADER	M	5	Verb which can change any header value.
	M	3	Verb which can list and store for use any header value.
OPTICAL	M	20	Better methods for radio/optical comparison; egs digitizing of optical plates radio contours on optical greyscale images radio/optical overlays
	H	5	Task to compact clean components files. See APCLN iteration limit.
	L	10	Verb to catalog extension files to be kept even if map is deleted.
	M	15	TV display of visibility data versus time and baseline for editing capability.
	M	4	Insert crosses on TV image at specified locations.
	L	10	Task to automatically search for and fit discrete sources in a map.
	M	10	Define blotch area using TV and trackball, to be used as a window for tasks and verbs.
	M	5	Task to recalculate u,v,w of visibility data.
VLB	H	60	Continued development and debugging of AIPS VLB software.

DOCUMENTATION OF SOFTWARE

COOKBOOK	H	5	Keep up with 2-month updating.
	M	5	Better isolate system dependent parts of cookbook. Write sections appropriate to CVAX, MODCOMP and IBM.
	H	10	Print AIPS cookbook using TEX verstec package.
	H	2	Better compatibility with GREEN BOOK. Present version is out of date.
EXPLAIN	M	30	EXPLAIN files for moderately deep documentation of all software.
SLICES	M	4	Better documentation of slice analysis software. Probably should be put in cookbook.
HELP	M	10	ADVERB help files way out of date.
DISKS	H	2	Need mount/dismount/trouble documentation for disks in several appropriate places.
TASKS	M	5	Documentation in several convenient places of all facets of writing, debugging and installing a task in AIPS.
WHATSNEW	H	3	Fully document all significant changes for each two-month update.
MANUAL	M	5	Reorganization of the AIPS manual?
RUN	M	5	Better documentation of RUN files which may be of some general interest.

SYSTEM SOFTWARE

DESCRIPTION	PRIORITY
AIPS ON THE IBM Getting AIPS to run on the IBM under various systems.	HIGH
VIDEO DISK Implementing inexpensive video disk record and playback system.	HIGH
EXTEND/REVISE HEADER Additional header elements are needed, especially for spectral line and non-VLA processing. Several alternatives are available from minimum disruption of AIPS to redesign of headers. See a recent Jaffe memo. Compatibility with pipeline is useful.	HIGH
UV TAPE FORMAT New UV data format is needed. Two alternatives are FITS-UV or a modified EXPORT format. Compatibility with pipeline is useful.	HIGH
USE I*4 SOFTWARE CODING IN AIPS Restrictions against using I*4 in the AIPS code are now not necessary. Maps could still be stored in I*2.	LOW
FORTRAN 77	MED

Should AIPS begin using FORTRAN77? See recent Jaffe memo for pros and cons. Must be done eventually. Can we slide into FORTRAN 77 gracefully without much initial conversion? Disagreement here.

SWITCH IN AIPS FOR DIFFERENT SOFTWARE SETS. HIGH
Conversion now in progress. There will be one data base but several versions of software. Reorganization of software code directories are necessary for this change.

AIPS # MED
Some user choice of which AIPS number to run under is useful. This has been partially implemented.

EXECUTION OF VERBS AND TASKS MED
Different syntax for running verbs and tasks can be confusing. Recent implementation--
GO <VERB> or GO <TASK>
both work.

IMPROVE HI FILES MED
More automatic way of adding INPUTS to existing HI files
Make HI files a text file for easier editting
Easy transfer of HI files to a batch or run files in order to reprocess data.

MEASURING ENGINE MED
Communication between measuring engine and AIPS.

DICOMED HIGH
More direct interaction between AIPS and DICOMED. Work in progress.

POPS GLOBALITY LOW
Making adverb values in POPS less global in character, especially useful in procedure building.

IMPROVE MESSAGE FILE MED
Have selective printout of parts of file. See PRTMSG.
Could files be a text file for easier handling.

SOFTWARE DOCUMENTATION MED
Version #, programmer and date associated with each program. Also have audit trail for each piece of software.

USE OF TEXT FILES MED
More use of text files for extension files. Easier editting capability and more generality is software access.

CATALOG FILES LOW
CA files now contains all header information as well as a small index files for all the headers. Keep index files but put headers with maps. Would be a bit safer for disk crashes.

WILDCARDS IN MAPNAMES HIGH
Use wildcard syntax for characters in mapname. See recent memo by Ekers and Clark. Useful for implied looping and more flexible naming control. Compatibility with Pipeline is important.

WHATSUP ETC. FILES HIGH
Reorganization of index files of AIPS software. Some is being done with the software switch. Need something which is useful and easy to use for the beginning programmer.

MAP DATA FORMATS LOW
Conversion to R*4 map pixel format. Now used only for some cube

applications. More fleixible basic I/O routines for arbitrary formats?

AIPS EDITOR MED
Improvement of AIPS editor for procedures and batch files. Editing capability of RUN files inside of AIPS would be nice.

TAPE MOUNTING MED
Make tape mounting in the VAX simpler. Try to have mounting and dismounting within AIPS.