

The AIPS Wishlist

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1.0 INTRODUCTION

I have been asked to convert the normal "Wishlist" maintained for AIPS into a document for discussion. In particular, I have attempted to assign some priorities to things. This is somewhat hard to do since some items are normally low priority but can become temporarily important for some reason. Others are intrinsically low priority, but, because they are easy or are part of a program being changed for other reasons, are more likely to get done. Rather than assign simple numbers to priorities, I have attempted to describe these other considerations.

As a further variable for debate, I have added "***" before those items which I think are likely to be done in 1985 and "??" before those upon which work might be done in 1985. I have also added tentative assignments. In general, I have taken on more in these than I can realistically do. It is my intention in some of these to do some detailed design plans and then to ask someone else to complete the coding.

2.0 GENERAL MAINTENANCE

These items normally do not require much continuous effort. However, when they need doing, they receive more or less top priority.

1. ** Source code/library maintenance, version updating (Gary, all)
2. ** AIPSLETTER:
 - ** writing --- carry new section on software changes (Eric, Don)
 - ** type setting (Eric)
 - ** mailing (Nancy)
3. ** Gripes:
 - ** receipt (Nancy)
 - ** initial review (Eric)
 - ** first-pass responses (all)
 - ** "to-be-continued" (Nancy, all).

4. ** COOKBOOK:
 - ** maintain, publish (Eric, Don, Nancy)
 - ** rewrite (for 15JAN85) including
 - = ** some instructions for Unix installations (Kerry)
 - = ??? Chapter 9 ? and what ? (Help!!!)
5. ** Source code export (all)
6. ** Simple bug corrections (all)

3.0 PROJECTS IN PROGRESS

These items do not require a high level of effort at this time. However, they are important and will be assigned all the man power needed to complete them in a timely fashion.

1. ** Code development and debugging: (Eric, Don, Pat)
 - ** develop new 3-level sets of code ("test", "new", "old")
 - ** develop process for debugging new "new"
 - ** develop system for maintaining all code levels at VLA as well as in CV
2. ** Move 15Oct84 to Modcomp (pre-Cray certification):
 - ** continue to repair compile/link failures (Eric)
 - ** test (Eric, all)
3. ** Cray Project:
 - ** write Z's (Kerry, Bob Duquet)
 - ** write Y's (Eric)
 - ** special AP package?
4. ** VAX speed up:
 - ** turn on 4.0 and make needed fixes (Gary, Pat)
 - ** try /OPTIMIZE and debug it this time (if possible) (Gary, Pat)
 - ?? try shared-image libraries and load modules (Gary, Pat)
 - speed up pseudo-AP (beyond /OPTIMIZE) ? (Pat?)
5. ** Calibration and Editing project:
 - ** system support (Bill, Eric)
 - ** format design (Bill, Eric)
 - ** fundamental service routines (Bill)
6. ** UNIX Project:
 - ** clean up Z's (Kerry)
 - ** clean up installation (Kerry)

7. ** Gripes (speed responses, make easier to manage):
 - ** establish system for handling them using Nancy more (Eric)
 - ** sort, list, extract routines (Don)
 - ** Index: by keyword, by respondent (Don)
8. ** Image storage unit and control panel: (Don, Arnold)
9. Test CONVEX C-1?? (Kerry, ?)
10. ** Certification and Benchmarking Package (Don)
11. ?? AIPS Site Survey (Don, Nancy)
 - ?? program to synthesize forms from WHOGETS.ADR, (Don)
 - ** make sense of current WHOGETS.ADR "contact" entries (Don, Nancy)
 - ** organize files of all correspondence with users and sites (Nancy).
12. ?? Portability improvements
 - ** Y routines for non-TV sites (i.e. stubbed with error returns) (Eric)
 - ?? Remove complex arithmetic wherever possible (Bill, whoever)
 - ** VAX preprocessor to insert IMPLICIT NONE to test all code (Gary)
 - ** Check VAX Z routines for more detailed comments and clarity (Kerry, Eric, Gary)
 - Make more Z routines generic - maybe not Z afterwards (Kerry, Eric, Gary)
 - Implement "path" concept of hierarchical host- and device-dependent libraries (Eric, Don, Gary, Kerry)

4.0 SYSTEM IMPROVEMENTS

These items are harder to prioritize because they tend to be system wide in their impact. We can get along for a while without doing them, but the work of doing them will then grow with time. They tend to be fairly easy to do, but to take some time because they are spread out over many modules. Also, some of them cannot be done a bit at a time since they involve converting all routines which call some routine (for example).

4.1 Higher Priority:

1. ** Get new Z routines into everything: (Eric, all)
 - ** ZCMPRS
 - ** ZCREAT - make Zs and insert (new argument)
 - ** ZEXIST - make Zs and insert
 - ** ZEXPND - make Zs and insert
2. ** Scratch files:
 - ** create as SNCRD and catalogued (Eric)
 - ** Insert everywhere (SC files only) (Eric, all)
 - some concept of preferred disk for scratch (???)
 - ?? BADDISK more widespread (whoever)
3. ** Other temporary things removed: (Eric, Gary)
 - ** MINIT, MDISK, MINSK, MSKIP,
 - ** COMOFF, MAPSIZ, FSWTCH,
 - ** ZFIO, ZMIO,
 - ** NSPG,
 - ** INTYPE, IN2TYPE, IN3TYPE.
4. ** Documentation:
 - ** upgrade GoingAIPS to 15OCT84 / 15JAN85. (Bill, Eric)
 - ** advertise 6250 bpi better (Cookbook, Helps, ...) (Eric)
 - ** Volume 2: what's left? Move it to Volume 3. (Eric)
 - ** Volume 1:
 - = ** listing of all HELP/EXPLAINS most important, but probably ok, (Eric, Don)
 - = ** discard Chapter 1, update Chapter 2, (Eric)
 - = what needed for Chapter 3, (Pat ?)
 - = ** maybe rename as "AIPS User Reference Manual"? (Eric)
5. Intertask communication:
 - ** level 0: resuming AIPS, AIPSB on task aborts - Vax solution or, preferably, a machine independent one (Eric)
 - level 1: leave "message" to APCLN, MX to quit at next major loop, etc.
 - level 2: return adverbs.

6. ** Go over all AP tasks:
 - ** Do they close the AP whenever possible (VM et al. suspect, also VBFIT)? (Pat, Bill)
 - ** Do they all use the roller where it might be needed? (Pat, Bill)
7. ** Gain files to standard Table type: (Bill)
 - ** fix ASCAL, VBFIT (Bill)
 - ** fix ASCOR, VBCOR, VSCAL, BSCAL (Bill)
 - ** fix GNPLT, PRTGA (Bill)
 - ** fix FITTP, IMLOD, UVLOD to handle them (Gary)
 - ** all tasks which copy gain files (Eric, whoever)
8. ** Standardize KEYIN package of subroutines (Eric, whoever)

4.2 Lower Priority:

4.2.1 Display: -

1. ?? printer routines DOCRT option:
 - ?? EXFND, PRTACC, PRTAN, PRTDR, PRTGA, PRTTP
2. ?? Date/time on plots; plot file creation to HI file (Eric)
3. ?? Star positions on plots; Clean beams on plots (Gary?)

4.2.2 Source Code Maintenance:

1. ?? FUDGE, TAFFY (Eric, Gary, Bill)
 - ?? clean up declares (separate commons)
 - ?? isolate output file stuff (for easy removal)
 - ?? explain second input file better
2. Start standardizing things
 - CANDY important

3. Documentation:
 - ?? Havlen/Fomalont "DEMO" image file? (Eric)
 - ?? under the mythical user number 1? (Eric, Gary)
 - = method for auto generation
 - = install method in code
 - = generate files
 - ?? AIPS Manager manual: (Eric, Gary, Kerry, Don)
 - = ?? service programs
 - = ?? magic places to change in code (TIMDEST, ...)
 - = ?? System configuration recommendations
 - = ?? implementing various peripherals
 - ?? AIPS memos to be finalized:
 - = ?? Use of EMACS editor with AIPS files (Don)
 - = ?? Mailing List Package (Don)
 - = ?? Checkout System (Gary)
 - = ?? Gripes Procedures (Eric, Don)
 - XREFS:
 - = ?? program to read Modcomp XREF tape, make sorted files, print
 - = Vax version of XREFS
 - = Vax cross reference by task rather than individual module
4. HI file access easier in WaWa package
5. ?? Havlen/Fomalont "DEMO" image file? (Eric)
 - ?? under the mythical user number 1? (Eric, Gary)
6. ?? Review AIPS coding standards. (Eric)
 - ?? Develop a plan for changes (if any). (Eric, Don, Bill)

5.0 TASKS

These are tasks which are likely to be a lot of work, but they will require only one person at a time per task. All of these need doing.

5.1 High Priority (important Tasks):

1. ** MX (Bill, Pat?)
 - ** # components / field
 - ** problem with grid correction (also UVMAP) -> clean failure
 - ** display all or selected dirty fields on TV
 - ** TXINC, TYINC option
 - ** bug: restarts clean rather than new name even if OUTS=0.
 - ** NITER < 0 => stop at first negative
 - ** turn off "write" flag when image is stable (and be patient about setting it busy again when it must)
2. ** APCLN (Bill, Pat?)
 - better beam fit (also MX)
 - ** stop on first negative option
 - ** don't stop major cycle just a few from NITER
 - ** save residuals and cleaned image option (???)
3. ** UVMAP (Bill, Pat?)
 - ** (PSAP version) bugs re GRIDAP call, sign of DXCOR/DYCOR
 - Sum weights near center (guide for ZEROSP)
 - Zero spacing for multiple channels
 - ** TXINC, TYINC option
4. ** ASCAL (maybe redone via Calibration package) (Bill)
 - summary statistics on bad solutions (i.e. > 10%) and on RMS, mean for each antenna/IF
 - self-contained plot option (???)
5. ** UVSUB (Bill, Pat?)
 - point and Gaussian options
 - ** recognize STOKES < 0 images (and matching data)
6. ?? Rewrite COMB: (Eric)
 - ?? faster
 - ?? floating and/or integer inputs ok
 - ?? Documentation confusing
 - ?? Use physical units in cutoffs (defaults still %)
 - Generalized operators
 - check OPCODE list against IPPS operators
 - ?? Remove bias in $\sqrt{A^2+B^2}$ images (option)
 - ?? include CORMS options
 - ?? Fix CORMS bugs:
 - = ?? APARM(4 - 7) not in HI
 - = ?? aborts if no "good" points

7. MCUBE
 - for cubes
 - INSEQ axis if all same
 - align with shifts (?)
8. ** RUN files cataloged under user number (Eric, Gary)
 - ** password option to enter AIPS
 - ** service programs to be limited by password to Manager
 - ** user #1 = Manager - provide RUN procs for transport
 - RUN files to/from FITS tape (requires a text file writing routine!)
 - Machine-independent editor for RUN files - a dream, we don't have the time
9. Check times in DBCON (Doarray set for no arrays)
 - Correct position shift (incl u, v, w)

5.2 New. Significant Tasks:

1. ?? AIPS table files; what next: (Eric, whoever)
 - ?? sort/merge/resort in one task
 - ?? flag
 - ?? plot
 - ?? histogram
 - others: check IPPS AUTOPHOT list.
 - interactive editing task
2. ?? Interactive (TV) visibility data editing: (Eric, Bill)
 - ?? display in current sort order
 - ?? allow (software) zoom
 - ?? flagging
 - ?? enhancement functions (of TV display)
3. Calibration and Editing project: applications software
4. ?? Dicomed tasks - DICPL, DICTV, DICTP ? (Eric, Pat?)
5. ?? Improved Geometric Capabilities: (Don, Thad)
 - ?? finish cleanup of PGEOM
 - ?? speed up LGEOM
 - construct LGEOM clone to perform arbitrary conversions between nonlinear projections.
 - Combine LGEOM, PGEOM, and Re-projector tasks into one?
 - task to "feather" re-projected images into giant mosaics
 - Design new "LGEOM":
 - = avoid virtual memory
 - = utilize vector hardware (both PSAP and 120B)

6. Combine single-dish and interferometer data
7. ?? "UNARY" operator task (Don, Thad)
 - ?? check IPPS "unary minus" menu
8. Rebuild Measuring Engine as AIPS Task (Don)
 - integrated into AIPS
 - catalogs and measurements as tables files
 - solve plate constants against multiple catalogs
 - measurement process driven by tables of coordinates
 - image capture with precise geometry
 - digital/analog image registration using two TVs

5.3 Medium Priority (lots Of Work. Less Used Programs)

1. GRAYS:
 - use TV LUT as option
 - load w functype
 - correct doalign tests
 - center the pixels
 - step wedge with labels option
2. ?? GETERR: (Eric, Gary)
 - ?? drop NGAUSS argument, inside NGAUSS -> MGAUSS
 - ?? Fix SLFIT (also test on DEXP, TOL to GETERR)
 - ?? add baseline fitting to SLFIT - how to store answers?
 - ?? Fix new IMFIT
3. ?? Slices (Eric design, Gary)
 - ?? print out values (verb?)
 - plot multiple offset slices
 - Moment fit slices
 - BLSUM: option to catalog results (???)
 - ?? SLICE:
 - = ?? make 2-d image from cube.
 - = ?? fails on XGAUS (.CENTR) images ?
 - ?? SLFIT:
 - = ?? clean up units, display
 - = ?? fit a baseline
4. ?? XGAUS (Eric)
 - various restart options
 - ?? error ? on NGAUS = 4
 - ?? 2-D in, 1-D out fails ?
 - ?? bug in CENTR maps (NGAU=2)
 - ?? "no plot when fitting 1 profile"

5. Continuation line (or something) for long ADVERB = *, *, *, ... statements.
6. GNPLT - (do after gain file format change):
 - Capabilities of GAPLT
 - Alternate plot symbols
 - other axis types and scalings (esp. "scan number")
7. ?? IMMOD - Clean up: (Eric)
 - ?? BMAJ, BMIN = radii in asec, not axes
8. ?? UVMOD - Clean up. (Eric)
9. ?? PBCOR: (Eric, Gary, Ed)
 - ?? rewrite to standards
 - ?? allow non-VLA antennas
10. VBPLT:
 - check use of JULDAY
 - scale each baseline separately
 - handle multiple pages better
 - speed it up
 - ignore deleted antennas
11. Rewrite RM:
 - easy inputs
 - standard units and code
12. Header: shift parameters to more user-oriented meaning
13. Read/write FITS files from/to disk.
14. Rewrite IMFIT:
 - to standards
 - to work
 - to write components in a CC file
 - print RMS before fit
 - accept initial guesses for 0-level, slope

6.0 MISCELLANEOUS

These items are easier to do and need doing. Some are simply in the nature of bug checking, others are responses to Gripes.

6.1 Verbs:

1. ?? Verb to insert a pixel value in an image. (Eric)
2. ?? INPUTS, HELP, EXPLAIN should use SCHOLD for screen full (Gary)
3. ?? Verb to "set TV cursor on RA,Dec" - i.e. graphics box (Eric)
4. ?? TKSET - clarify cursor positioning in the Help file (Don)
5. ?? EXTLIST: (Eric, Gary)
 - ?? display slice fit results
6. ?? (VAX) REWIND available as quick return (???) (Gary)
7. ?? TKSLICE - display y axis even if undefined units (Gary)
8. TV labeling:
 - include user character string
 - clean beam
 - new LYPES: source name, angular scale, freq
9. TV:
 - anti-wrap alogorithm causes strange behavior at high zoom
 - new spiral hue/intensity LUT (see gripe 1218)
10. Convert FRMT to a Z routine.
11. Verb to catalog extension files
 - (Add tests for primary type = desired extension type to TKSL verb, SL2PL, PRTAB, ...)
12. Verbs:
 - FINDSPACE - find disk number with most space
 - FINDNAME - find image with some name parms.

6.2 Tasks

1. ?? Update HELP TASKS. (Don?, ?)
2. ?? AIPSC : option to turn off checking (some procs get 0 divide?) or make response to errors optionally less drastic (Eric)
3. ?? (VAX) Task can grab message terminal/file when aborting during MSGWRT. (Gary)
4. ?? Source code import
 - ?? Check in COMTAL Y routines (Eric)
 - Other submitted programs: ???
5. ?? UVFLG - Change to accept APARM(9) = 400 as = 4.
6. ?? PRTAN - spelling of "FEED", null Sidebands not blank (Bill)
7. ?? VBCOR - Explain differs from Help on meaning of BPARM (Bill)
8. ?? TVHXF, TVHLD - YIMGIO error 2 (Eric)
9. ?? BLANK - option to reverse sense of blanking (Eric)
10. SUBIM - DOALL option
11. ?? Does PRTP count label files as files? (Eric)
 - ?? it should.
 - OR: change AVFILE (incl. in tasks) to skip label files without counting them.
12. PCNTR
 - accept and convert I, Q, U images also
 - ?? use physical units in FACTOR, cutoffs (default still %) (Eric)
13. Upgrade EXFND to be like UVFND in STOKES and output format
14. UVEXP - error leading to apparent loss of sort order ?
15. VBFIT (Bill)
 - print accounting of flagged and blown solutions (like ASCAL)
 - ?? Explain refers to non-existent table for APARM(3)
 - Option to print delay, rate, S/N, oversampling used.
 - ?? Inputs has default for solution interval in wrong place.
 - ?? Ignores BADDISK.
16. UVCOP
 - DOALL option
 - option to start with smaller output file (disk-full problems)

17. CLIP - Support STOKES (a la UVFND) - how? if V too large, flag RR, LL?
18. Rewrite CCMOD (see Benson's version); pixels may be better than asec (???)
19. SUMIM:
 - Other ways to get input images besides DO loop on INSEQ
 - Bug? (reported 10**31 peak from it)
20. ?? Source-code export: (Eric, Kerry, Gary)
 - ?? FITS version of EXPTAP (called EXPFIT currently)
 - ?? a reader program (requires text write routine!)

7.0 OTHER THINGS

These are other suggestions, some good and some bad, recorded here so they will not be lost. We might get to these some day.

1. Users' Group: meetings, software exchange, etc. (???)
2. Improve the computation of the vertical scaling of PROFL plots.
3. False color usage in areas of:
 - polarization
 - spectral index
 - UV
 - spectral-line: sum(I), velocity, width
4. Fancier contouring:
 - bold, labeled contours
 - ingoing ticks for minima
 - follow contour
5. Other axis types:
 - Mercator
 - Aitoff projection
6. ?? PRTPL (Gary, Eric)
 - ?? speed - new bit routine, quick gray-scale
 - ?? line width control (for low-resolution devices)
 - ?? better grey scale options and algorithm (like QMSPL)
7. Compare CONVL and SMOTH

8. APMAP
 - NPOINTS adverb (or delete it!)
 - DOALL option
 - bad sort (???)
 - Could we replace it with a procedure that would "pipeline"
 UVLOD, UVSRT, and UVMAP, maybe as a "task" which would
 initiate them as sub-sub-processes? (????????)
9. Task to do direct Fourier transform mapping
10. Task to remove current clean comps from image and put back with
 another size.
11. IMLOD
 - DOALL option for FITS files
 - combine UVLOD and IMLOD
12. Grid to output image (e.g. time-baseline) (extend GRIDR ?)
13. Task to find and classify sources.
14. Catalog: NEXT
 - return array of catalog numbers (???)
 - rename a set of maps to sequence the SEQ #s (???)
15. FINISH should be ok at end of any line in proc
16. ?? IF-THEN-ELSE should work properly without the ELSE (Eric)
17. PROC(array) should work when called as PROC(scalar)
18. IMHEADER (n) ; QHEADER (n) (???)
19. Investigate troubles with blank tapes on DOEOT.
20. An AIPS Tee-Shirt!?