AIPS MEMO NO. 62

The AIPS Wishlist

Eric W. Greisen

31 August 1989

National Radio Astronomy Observatory
Edgemont Road, Charlottesville, VA 22903–2475
804–296–0211 (FTS 940–7211), x328; TWX 910–997–0174
aipsmail@nrao.edu

INTRODUCTION

The Wishlist for *AIPS* appeared initially as *AIPS* Memo No. 34 (February 1985) and has appeared with revisions several times thereafter. The most recent previous edition was released as *AIPS* Memo No. 55 (October 1987). Entries in this edition were completed on 31 August, 1989, but the indications of completion on some of the entries were updated through most of October. A document like this is very hard to organize since programs, or the intended changes in them, often fit in more than one category and single types of changes often apply to more than one program. Nevertheless, it is still useful to maintain a somewhat disorganized document to record brief descriptions of the many suggestions and complaints received by the *AIPS* group. In previous editions, I indicated the names of individuals expected to work on the specific entries. These assignments have been removed from this edition.

I have chosen to divide the document into the categories: (1) General maintenance, (2) System code, (3), System-wide projects, (4) Tasks: UV, (5) Tasks: calibration and editing, (6) Tasks: image making, (7) Tasks: image, (8) Tasks: display, (9) Tasks: tape, (10) Tasks: extension files, (11) Verbs: application, (12) Verbs: system or *POPS*, and (13) Documentation.

A code is shown to the left of all items listed. The code is "`**`" for those items which I think have a good chance to be done in the next year and "`??`" before those upon which work might be done in the next year. Items not falling into one of these classes are preceded by "`..`" to make their lower priority more visible. The last publication of the Wishlist was on 15-October-1987 as *AIPS* Memo No. 55. Items which have been added or revised since the last publication have the codes "`N`x" or "`n`x" (where "x" is "` `", "`?`", "`*`", or "`.`" and "`N`" means new and "`n`" means revised in a minor way). Similarly, items which have been completed, one way or another, since the last publication are marked with a "`D`x". Please note that the prioritization given here represents only my suggestions and should not be taken to be the actual policy of the NRAO or its *AIPS* group.

Numbers in parentheses in the text are references to gripes on the particular subject which provide additional comments expanding on the necessarily brief descriptions appearing in this document. The text of the gripes is found in `DOCGRIP:` on the Charlottesville Vax. In addition, notebooks containing the gripes are in the *AIPS* Caiges at the VLA and in Charlottesville.

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
2. ** *AIPSLETTER*:
   - ** writing
   - ** type setting
   - ** mailing
3. ** Gripes:
   - ** receipt
   - ** initial review
   - ** first-pass responses
   - ** "to-be-continued"
4. ** *COOKBOOK*:
   - ** maintain, publish
     - ** some instructions for Unix installations
5. ** *GOING AIPS*:
   - ** maintain, publish
   - ** rewrite to account for code overhaul
6. ** Certification and Benchmarking Package (`DDT`)
   - ** develop version for VLBI data and procedures
   - ** develop version for calibration data and procedures
   - ** plan procurement-level test procedures and criteria
7. ** *AIPS* Site Survey
   - ** prepare and send out 1989 survey
   - ** analyze returns from 1989 survey
8. ** Source code export
   - ** several suggested improvements (2152–2160)
9. ?? Review *AIPS* coding standards.
   - ** memo re language standards
10. ** Simple bug corrections
11. ** Users' Group: meetings, software exchange, etc.
    - .. set up computer bulletin board — ???
12. .. Biannual *AIPS* Workshops

SYSTEM CODE

1. `..` Compute server types of machines:
   - `..` special AP package: continue testing
   - `..` develop remote device handling: terminal, tape, TV
2. `??` Source code/library maintenance, version updating:
   - `**` regularize Unix midnight job, put it back on CVAX
   - `??` `PUTBCK` error messages to give file name (3059)
   - `??` midnight job should check for one already running (3281)
   - `??` `PUTBCK` to enforce precursor comments, ownership rules
   - `??` document and reply to Sun 4.0 troubles (3682)
   - `??` Alliant release missing `WHNALT` (3655)
   - `??` do not delete object code as planned in relation to Alliant (3705)
3. `**` Portability improvements
   - `??` remove complex arithmetic wherever possible
4. `**` Z-routine problems:
   - `**` many programs call `ZOPEN` wrong: require exclusive on read, don't wait (*e.g.*, 2318)
   - `**` Convex auto-tape-dismount can hang the terminal (3067, 3163, 3435, 3499)
   - `??` `TVFLG` gets "niced" (3249)
   - `??` Tektronix assignments etc. not work well under Unix (3152, 3275)
   - `??` TK Sun window can't read inputs after close of plot (3384)
   - `??` permission error reported by `ZQMSCL` (3306)
   - `**` `ZAP` very slow on Convex (3359, 3360, 3363, 3383, 3585)
   - `??` "atomic" file creation causes real problems (3361)
   - `??` accounting file was getting locked on Cholla (3453)
   - `??` review abort handler: work? do we need core files? (3496)
   - `??` test available `POPS` numbers before asking device questions (3689)
   - `??` Unix (NRAO1 ?) print jobs put two blank pages at beginning (3723)
   - `..` `telnet` entered job had task messages on message terminal (3729)
5. `**` Y-routine problems:
   - `**` IVAS cursor 2 pixels off in x again (3366)
6. `??` Porting and benchmarking
   - `??` get results/proofs from Alliant, Ardent, Stellar, Multiflow
   - `??` assist port to IBM
   - `**` Cray (Unix) port and test — in progress
7. `??` Improve *AIPS* usage from private accounts
   - `??` VMS — what are the problems?
   - `??` Unix — what are the problems?
8. `**` Vax speed up:
   - `**` try `/OPTIMIZE` and debug it this time (if possible)
   - `??` try shared-image libraries and load modules
   - `..` speed up pseudo-AP (beyond `/OPTIMIZE`)?
9. `??` (Vax) `REWIND` available as quick return (???)
10. `??` Installation procedures
    - `**` VMS documentation needs more explanation
11. `??` Source-code export:
    - `??` convert `EXPFIT` and `IMPFIT` to blocked tapes

12. ?? *AIPS* maintenance tools
    - ?? make into verbs/tasks for user 1 only?
    - .. COPY to be able to do format conversion like UPDATE?
    - ?? change SETPAR to release SP file most of the time (3297)
    - ?? change SETTVP to release ID file most of the time
    - ?? change PRTAC to release AC file some of the time

SYSTEM-WIDE PROJECTS

Higher priority:

1. ** MSGWRT has problems with NINTRN > 10?
2. ** Remove INTYPE except where required
3. ?? Mysterious, non-repeatable problems
   - ?? AP hangs up — maybe controller problem
   - ** Tektronix 4012 cursor reading on the Convex (2570 and others)
   - ?? I^2S interactive verbs hang CV Convex
   - ?? NRAO1 Convex aborts in MX, APCLN
   - ?? NRAO1 Convex aborts in VTESS (3721, 3763)
   - ?? NRAO1 Convex invents components with ASCAL (3694, 3761, 3762)
4. ?? Under VMS, page full locks terminal (2475, 2480)
5. ?? Image units, fluxes, coordinates
   - ?? IMEAN, IMSTAT, etc. recognize JY/PIXEL units
   - ?? these routines convert to flux if NITER = 0, but clean beam okay?
   - ?? IMEAN: put mean and rms on plots
   - ?? more general all-sky coordinate systems
   - ?? more pleasing coordinate names (2347)
6. ?? Reduce global adverb conflict problems
7. ?? I/O buffers: system-dependent sizes
   - ?? through several "Z" includes?
   - .. through dynamic memory allocation?

Lower priority:

1. .. Catalogs:
   - ?? display image sequence number with up to 5 digits (3717)
2. ?? GETERR:
   - ?? 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. .. Scratch files:
   - .. some concept of preferred disk for scratch (???)
   - .. user number in task names (ignored sometimes, used others)?

4. ?? FUDGE, TAFFY
   - ?? isolate output file stuff (for easy removal)
   - ?? explain second input file better
   - ** bug in windowing in TAFFY (2636)
5. .. One-dimensional data:
   - .. "front-end" to read in single-dish data
   - .. better handling methods (multi-source *uv* format?)
6. .. Start standardizing things
   - .. CANDY important
   - .. install MAT on CVAX and try it on the code
7. .. Intertask communication:
   - ** priority and CPU limit adverbs
   - ?? add SHOW and TELL to more tasks
   - .. level 2: return adverbs.
   - .. spawn and attach operations (1421)
   - .. save ephemeral results in file and pick up in *POPS*
8. ?? Debate default on OUTDISK = 0 re private packs.
9. .. Header: shift parameters to more user-oriented meaning
10. ?? Standardize KEYIN package of subroutines
    - ?? problems parsing comments (3309)
11. ** Go over all AP tasks:
    - ?? develop better queue for AP — ASCAL admit it's done
    - ** do they close the AP whenever possible (VM *et al.* suspect, also VBFIT)?
    - ** do they all use the roller where it might be needed?
    - ?? why does FPS AP hang up sometimes?
    - ?? use APWAIT after all APPUTs? (3347)
12. .. Code revisions:
    - .. make update installation easier
    - .. change TST/NEW/OLD nomenclature to date names ????
    - .. paraforms for reading more than one image
    - .. GTPARM use Help file to get parms by name from TD file????
    - .. allow subdirectories in user catalogs (2308)
    - .. user catalogs to carry total file size????
    - .. user catalogs to carry file creation date????
13. .. HI file access easier in WaWa package

TASKS: UV

Higher priority:

1. ?? PRTUV
   - ** fails on DOCRT = 79 (2968, 2970)
   - ?? displays flagged data? (3193)
   - ?? invent method to displays weights < 1 — also UVFND (3370)
2. ?? UVDIF
   - ** fails whenever BIF > 0 (2969)

3. ** UVSUB
   - ** troubles with multiple CC files (2519–2520, 2627)
   - ** incorrect when field being subtracted offset from map center (3053)
   - ** rotation not handled correctly, subtracts at wrong place (3502, 3618)
   - ** fails using an image as the source model (3167)
   - ** SMODEL method zeros the full data set (3503)
   - ?? problems dividing *uv* data by image (3687)
   - ?? problem subtracting LL correlator (2565)
   - .. allow multiplication by model as well as division
   - ?? should check all Stokes at start, not much later (3151)
   - ?? serious differences detailed between subtraction methods (3352)
   - ?? history file incorrect as to method used (3501)

4. ?? UVFND
   - ** fails on DOCRT = 79 (2968, 2970)
   - ** fails on VCLP option (3122, 3462)
   - .. add opcode to display flagged data
   - ?? add SOURCES, FLAGVER, etc. options (2942)

5. .. UVCOP, DESCM
   - ** make interpretation of ANTENNAS and BASELINE smarter (3417)
   - .. DOALL option, different user option
   - ?? recompute time range before writing to history file (2764)
   - .. option to start with smaller output file (disk-full problems)
   - ?? add BIF and EIF option (3308)
   - ?? DESCM copies wrong visibilities by one (3381)

6. ?? CLIP: strange flux clipped on Convex (2219)
   - ** EXTIO errors reported (2534, ...)
   - ?? option of separate U, Q, V, or correlator clip levels (3015)

7. .. UVAVG
   - .. bugs: apparently reporting times out of order
   - ?? fails sometimes with overflow (2694)
   - ?? in MERG mode, deletes some baselines (2888)
   - ?? add calibration package, at least handle new random parms (3571)

8. .. VLBI improvements:
   - .. VBLIN shouldn't be case-sensitive in station names
   - .. interactive edit of SN files
   - .. *uv* plots with error bars
   - .. CalTech antenna locations read in wrong units (3635)

9. ?? VBCIT: error testing needed on DATAN2
   - ** antenna file not correct on output (2827)

10. .. DBCON:
    - ** loses observation dates for arrays ≥ 2 (3491)
    - ?? should check compatibility of AN tables (3700)
    - .. check times (DOARRAY set for no arrays)
    - .. correct position shift (including u, v, w)
    - .. clarify or change subarray handling (2085)

Lower priority:

1. `??` Check buffer size for *uv* tasks: enough for line?
2. `..` `UVFIX`
   - `..` several good suggestions for code and explain (2460)
   - `??` conversion error (2649)
   - `??` errors at high declination (2905)
   - `??` does only one subarray in an execution (2905)
   - `??` uses wrong coordinate rotation computation (3346)
   - `??` default IAT–UTC default value (3634)
   - `??` explanation of sign conventions needed in help (3634)
3. `??` `BLOAT`: generalize to build 16 chan from 2 8-chan, etc.
   - `??` add to *COOKBOOK*
4. `..` Create VLA Observ files with *AIPS* (???)

TASKS: CALIBRATION AND EDITING

Higher priority:

1. `**` `FQ` tables and `FREQID`:
   - `**` `FREQID = 0` not accepted by many tasks (3733)
   - `**` `FREQID` changes when appended to table (3733)
   - `**` too many `FREQID`s created (3733)
   - `**` tasks fail when `FREQID`, but not frequency, changes (3733)
   - `**` wrong frequency with a `FREQID` (3733)
   - `**` more explanation of `FREQID` required (3733)
2. `**` `CALIB`
   - `**` solutions fail more than with `ASCAL` and differ (3764)
   - `**` flux bootstrap failing with no error messages (2903)
   - `**` problem reported with only one source in file (2951)
   - `**` fails on single-source file (3423)
   - `**` fails using gaussian components (3166)
   - `**` has problems in source selection (3145, 3173)
   - `??` amplitude scale shifts despite option to hold it fixed (3376)
   - `??` solutions fail when `UVRANGE` tight, but adequate (3433)
   - `??` response poor when `UVRANGE` drop most data for some time (3012)
   - `??` problems doing self-cal of spectral line (3442, 3444)
   - `**` add `BIF` and `EIF` (2952)
   - `??` help file describe `NCOMP < 0` (3557)
   - `??` add help/explain on how to self-cal with `CALIB` (3601)
   - `??` `SOLMODE` confusion for VLB users (3609)
   - `**` displays of closure errors fail (3266)
   - `??` clarify and display info about "failed solutions" (3543)
   - `??` display version number of `SN` table as it is created (3545)
   - `??` add line printer/`DOCRT` option (2953)

3. ** General:
   - ** system support
   - ** clarify the meaning of time ranges (3196)
   - ** standardize/clarify the defaulting of extension version numbers (3202, 3253)
   - ?? `SU` table too confining (`FQ` solution?) (3391)
   - ?? add ability to edit `SN` tables easily (3429)
4. ** `LISTR`
   - .. include user scale factor (2544, 3256, 3426, 3551) — in progress
   - ?? scale factor changes hide bad data — stay fixed for a scan (3538, 3566, 3622)
   - ?? add choice of number of digits (3566)
   - ** ignores `SOURCES` in some cases (2900)
   - ** doesn't handle `STOKES` as advertised (2901)
   - ** incorrect times listed sometimes (2937)
   - ** problems display IFs (2955, 2956)
   - ** problem getting both amp and phase of gains (2959)
   - ** error initilizing (*sic.*) baseline file (2960)
   - ** doesn't do all requested channels (3230)
   - ** scan averaging and autoscaling problems (3180)
   - ** add option list weights (3180)
   - ** fails when requested data is absent (3228)
   - ** failed to list phase when expected on `DPARM(1)=5` (3231)
   - ** bad combinations appear on reasonable `ANTENNAS` and `BASELINE`, use `REQBAS`? (3232, 3523)
   - ** would not omit antenna as requested (3546)
   - ?? allow amp plus phase display on `OPTYP 'GAIN'` (3247)
   - ** display of amp and phase together doesn't really work (3426, 3448)
   - ?? allow unaltered display of any 2 correlators (3448)
   - ?? add display of difference of RR and LL phase (3247)
   - .. listing of `SN` could be more readable (3256) — in progress
   - ?? add option to reduce header displays (3426)
   - ?? `TIMERANG` misapplied in `MATX` listing (3345)
   - ?? change averaging time to seconds rather than minutes (3348)
   - ** `MATX` has problems averaging phases near 180 (3353)
   - .. add display of RMS of phases, *e.g.*, `MATX` (3426, 3544)
   - ** gives nonsense when start and stop time are same (3509)
   - ** unnecessary error message re `STOKES = ' '` (3532)
   - .. multiple sub-functions confuse the use of the adverbs — need procs to simplify (3535)
   - ** `MATX` header fails on page 3 (3536)
   - ?? pagination could be improved some (3539)
   - ?? `MATX` to loop over all requested IFs (3567)
   - ?? `GAIN` does not include date, time, user number, ... (3589, 3639)
   - ** `GAIN` claims units are JY, but they aren't (3590)
   - ** `SCAN` aborts on single-source file (3756)
5. ** `MULTI`
   - ** make it less sensitive to number of random parameters (3050)
6. ?? `CLCOR`:
   - ?? questions about sign conventions (3254)
   - ** changes amplitude, not phase, on RL offset (3350)
   - ?? confusion generated on versions of `CL` table (3372)
   - ?? fails on `CL` file version 3 (3734)

7. ?? `CLCAL`:
   - ?? doesn't work when applied twice to same `SN` table (3397)
   - ?? has problems interpolating rapidly changing phases (3418)
   - ?? needs `EXPLAIN` file (3517)
   - ?? should renumber output extension file to 1? (3518)
   - ?? bad selectivity of calibrator sources (3591)
   - ?? problems locating `CL` tables (3650)
   - ?? add `ANTENNAS` option to deal with discontinuities (3737)
8. ?? `ANCAL`:
   - ?? details of NRAO-standard gain curves should be in help (3633)
9. ?? `SPLIT`:
   - ?? several errors in splitting multi-IF file (3255)
   - ** wrong source coordinates in output file (3349)
   - ?? change default `SUBARRAY` to all, be forgiving on `STOKES` (3465)
   - ?? `CL` table version number to `HI` file (3519)
   - ** messes up header alternate axis, rest frequency, etc. (3529)
   - ** not delete output due to catalog `CLRD` status problems (3549)
   - ** aborts on Convex when doing two IFs (3638)
   - ?? `DOBAND = 3` mode had problems with flagged antennas (3651)
   - ?? add option to skip copying of history file (3668)
   - ?? missing data that should have been output (3727)
10. ?? `PCAL`:
    - ?? overrides the user-installed polarization parameters (3269)
    - ** doesn't handle multi-IF correctly (3371)
    - ?? loop over IFs or drop `EIF` from adverbs (3567)
    - ?? improve the help and explain info (3592)
    - ?? make `SOLINT` give worst case, program should use longer where possible (3602)
11. ?? `GETJY`, `SETJY`:
    - ** work? (3329, 3356)
    - ?? `GETJY` needs clarification of use of `SN` table (3431)
    - ?? extend usage to solve for fluxes from uncalibrated data (3432)
    - ?? `SETJY` conventions confusing — clarify (3430)
    - ?? default IFs do only one IF, not all (3515)
    - ?? didn't change `SN` table for `STOKES = 'R'` (3736)
    - ?? dies on "already open" file (3749)
12. ?? `UVFLG`
    - ?? change to accept `APARM(9) = 400` as `= 4`.
    - ?? clarify the confusing array of options (2437, ...)
    - ?? be more communicative (2530)
    - ** failing on Convex (*e.g.*, 2174) and Vax (2243)
    - ** problems describing the desired antenna pairs — use `REQBAS`? (3065, 3181)
    - ** troubles with unflagging (3183, 3184)
    - ?? print IF number also (3556)
    - ?? add option to flag in a box in *uv* coordinates (3029)
    - ?? add option to record commands in history file (3623)
    - ?? add more explanation of defaults to help (3633)

13. `D? TVFLG`
    - `D.` create method to display data despite gaps in time (3443)
    - `D?` go to time as non-regular grid (3666)
    - `D?` add option to load only cal or only non-cal sources (3412)
    - `D?` add option to apply same clip operation to all other IFs and channels (3443)
    - `D*` trouble with `AN` files when doing multi-channel (3876)
    - `D*` zero amplitudes appear when 8 or more channels gridded
    - `D?` troubles with TTY calls in using task (3808, 3868)
    - `D?` too many RMSes are zero (3547)
    - `D?` source name carries into rows with no data (3547)
    - `D?` data not flagged? (3669)
    - `D*` keep flag command on disk with work file: checkpoint (3118)
    - `D*` redesign work file to allow unflag, drop flags options (3393, 3427)
    - `D*` add option to allow multiple Stokes, like IFs, channels (3754)
    - `D*` change default `FLAGVER` to 1 (3861)
    - `D*` always put `FLAGVER` in history (3865)
    - `D*` report failure to flag any samples (3837)
    - `D*` time ranges listed strangely in `FG` table (3276)
    - `D*` times in history in sexagesimal (3531)
    - `D*` antenna-DT option aborts program on misplaced cursor (3735)
    - `D*` make writing of history file a user option
    - `D*` add option to simply build work file and exit (3092)
    - `D*` need easier exit from flag antenna section (3344, 3439)
    - `D*` need do-nothing exit from clip section (3443)
    - `D*` problems displaying 2nd subarray on `DBCON`'d data (3289)
    - `D*` sort by baseline length fails (3330, 3392, 3441)
    - `D*` fails to load all channels by default (3443)
    - `D*` problem loading only a single source (3357)
    - `D*` window setting unforgiving about being off the image (3510)
    - `D*` menu display very slow at least on IVAS TVs (3158)
    - `D*` option to make a single-source `FG` table (3051)
    - `D*` failed to die on `GTBWRT` error (3516)
    - `D*` loses or misorders data on multiple subarrays (3624)
    - `D*` fails to rewrite menu after set-window-load operation (3751)
14. `..` Calibration and Editing project: applications software
    - `..` task to be clone of Dec-10 `VISPLT` (2772)
    - `??` sparse-data interactive editor (3307)
    - `??` `TVFLG`-like editor with channels vs. time axes

Lower priority:

1. `**` `ASCAL` (maybe redone via Calibration package)
   - `**` gain file open error (2126)
   - `..` remove `READ` status on model file when done with `CC` file
   - `..` option to feed sky coordinates for point model
   - `..` summary statistics on bad solutions (*i.e.*, > 10%) and on rms, mean for each antenna/IF
   - `..` self-contained plot option (???)
   - `**` `DOCAT` option failing in `VSCAL`
   - `??` improve help file re `BITER` (2635)
   - `??` `VSCAL` doesn't work (2655)
   - `**` format error abort (2842)
   - `??` apparently can destroy `AN` files (3206)
   - `**` change `NMAP` to `NFIELD` (2301)
   - `??` add `FLUX` cutoff to the number of clean components used (2301)
   - `??` failure related to `LUN 17` (3128)
   - `..` Convex NRAO1 creates extra sources (3694, 3761, 3762)
   - `??` history file lacks number of components from images > 1 (3726)
2. `..` Gain files to standard table type or replace:
   - `..` fix `ASCAL`, `VBFIT`
   - `..` fix `ASCOR`, `VBCOR`, `VSCAL`
   - `..` fix `GNPLT`, `PRTGA`
3. `..` `VBFIT` — may be replaced by `CALIB`
   - `..` print accounting of flagged/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`??
   - `..` option not to write an output *uv* file
     - `..` keep `DR` files with input *uv* file, recognize by version #
   - `..` option to give list of reference antennas (1813)
   - `??` add info to help/*COOKBOOK* per gripe 2077
4. `??` `PRTGA`:
   - `??` error-handling in formats is needed (2675)
5. `??` `WTMOD`:
   - `??` handles flagged data badly (3283)

TASKS: IMAGE MAKING

1. `??` `CCMERG` — improve handling of flagged components
   - `??` message to reflect number unflagged in/out
   - `??` message to say omitted (or lost) number components due to flags
   - `??` add option to `CCMRG` to limit number components used (3046)
2. `??` `HORUS`:
   - `??` give user more control over output name (3525)
   - `??` add `DOBAND`, `BPVER`, ... to history file (3753)

3. ** `MX`
   - ** locks on one component: (Convex many gripes, Vax too (2124))
   - ** beam-patch troubles → clean divergence (2128)
   - ** Stokes `V` is actually Stokes `I` on Convex
   - ** put `PHAT` value and # components / field in `HI` file — latter done
   - ** problem with grid correction (also `UVMAP`) → clean failure
   - ?? display all or selected dirty fields on TV
   - ** `TXINC`, `TYINC` option
   - ** `NITER < 0` implies stop at first negative
   - ** turn off "write" flag when image is stable (and be patient about setting it busy again)
   - ?? output both clean and residual image (3004)
   - ** on `NITER=0`, do not set clean beam — confuses `CONVL`??
   - ** check handling of `BOX` — 10^{th} unused, funny ordering, ...
   - ** drop `XPARM` and `YPARM` inputs
   - .. rename shift parameters
   - ?? adapt to handle wider fields such as 327 MHz
   - ** aborting for overflow in gridding (2806)
   - ?? ignores alternate velocity axis parameters (2926)
   - ?? output naming problems, overwriting current files (2933)
   - ** artifacts caused by restart with existing work file (3148, 3204)
   - ?? output channel addressing problem when input channels averaged (3052)
   - .. option to use different disks for image and beam (3101)
   - .. reconsider definitions of zero-spacing flux (2261, 2272)
   - ?? add peak residual to output history file (2269)
   - .. zero spacing for multiple channels (2320)
   - ?? serious differences detailed between subtraction methods (3352, 3420)
   - ?? Convex aborts when `FACTOR` significantly negative (3413)
   - .. fails on miniscule images (3436)
   - ** `STOKES 'V'` does not work (3447)
   - ** does not handle multiple IFs (3375, 3683)
   - ** rotation causes subfields to be incorrectly positioned (3488)
   - ?? `CHINC` default behavior inconsiderate (3548)
   - ?? give message, or better, handle overlapped fields (3561)
   - ** `MXSEL` sets beginning component to 0 for channels 2 and beyond (3573)
   - ?? data missorted messages with spectral-line data (3575)
   - ?? add option to make work file a temporary `SC` to use `SC` disk (3605)
   - ?? gridding error when `FLDSIZE` greater than `IMSIZE` (3670)
   - .. history files are confusing for multiple fields (3724)
4. .. Single dish to *AIPS*:
   - .. single-dish CLEAN

5. ** UVMAP
   - ** produces artifacts in images on Convex (2193)?
   - .. sum weights near center (guide for ZEROSP)
   - .. zero spacing for multiple channels
   - ** TXINC, TYINC option
   - ** drop XPARM and YPARM inputs
   - ** UVWTFN option not working (2882)
   - .. option to use different disks for image and beam (3101)
   - ?? cannot handle 2nd IF (3264, 3375)
   - ** defects in corners of images — bad gridding? (3563, 3568)
   - ?? bad beam peaks with images apparently okay (3024)
6. ** APCLN, SDCLN
   - .. better beam fit (also MX)
   - ** save residuals and cleaned image option (???)
   - .. other clean-area options, *i.e.*, mask image (2489)
   - ** fails if AP is rolled in restore step (2381 among others)
   - ** better error handling on ZEXPND error (2544)
   - ?? failed on a 4096x2048 image (2710)
   - ** restart problems on cubes (2756)
   - ?? bugs affecting rectangular images with $N_y > N_x$ (3207)
   - ** BITER < 0 option fails on residual image (3214)
   - ?? discontinuity on restart in flux levels (3214)
   - ** fix to create CC files of version equal to plane number (3236)
   - ?? create output files ahead of scratch files (3130)
   - ?? Alliant troubles with WHNALT and QCLNSU (3658, 3659)
   - ?? blew up putting too many residuals in the "AP" (3702)
7. ?? VTESS, UTESS, LTESS:
   - ?? scale clean image correctly to be usable initial guess
   - ?? VTESS leaves image status set
   - ** fix to do standard handling of BLC/TRC (2572)
   - ?? zero spacing flux not used (2573)
   - ?? UTESS loses information about relative shifts of images (3291)
   - ?? UTESS aborts if an image is blanked (3317)
   - ** VTESS sometimes aborts just after displaying inputs (3326)
   - ** VTESS cataloged output files under user = sequence number (3454)
   - ?? change to make output files ahead of scratch files (3701)
   - .. LTESS explain file ends in mid sentence (3718)
   - ?? LTESS needs option to limit lowest usable primary beam level (3719)
   - ?? map type header parameter often wrong on output images (3765)
8. ?? Two-resolution clean, based in APCLN
9. .. APCLN-like task for non-symmetric beams: done to 1st-order
10. .. APCLN-like task for scalar and non-AP applications (2331)
11. .. Task to remove current clean comps from image and put back with another size.
12. .. Task to do direct Fourier transform mapping
13. ?? Difference mapping
14. .. changes to handle 8000 spectral channels??

TASKS: IMAGE

1. ?? FFT
   - ?? option: output amplitude, phase images
   - .. option: clipping output to user-specified value(s)
   - ?? fails on galactic coordinates (2750)
2. ** COMB:
   - ?? documentation confusing (may be better a bit now)
   - ?? cannot combine partly overlapped cubes (2462)?
   - .. generalized operators (more than 2 images, many ops incl. FFT)
   - .. pixel-weighted averages ...
   - .. check OPCODE list against *IPPS* operators
   - ?? poor default for maximum error (2607)
   - ?? put shifts for alignment into history file (2731)
   - ** update POLC correction method (2757)
   - ?? RM gets incorrect results (3034)
3. ?? MCUBE reported alignment problems (2763)
   - .. inconsistant in header lists clean components, but no CC file (3212)
4. .. SUBIM
   - .. DOALL option
   - .. ZINC option, but over all dimensions 3–7 or just 3?
   - .. option to sum/average over the XINC by YINC box
5. .. CONVL:
   - .. compare CONVL and SMOTH
   - .. add progress messages, decimation of output (2483)
   - ?? input file marked write (2485, 2507)
   - ?? trouble with small windows (2670)
   - ** random bad lines on Convex?? (2895)
   - ** convolution of 2 images is not interchangable (3066)
   - ** fails when using an input image (3213)
   - ** FACTOR incorrect and not in history as other than 1.0 (3003, 3238, 3714)
   - ?? correct units, scaling from JY/PIXEL on output (2374)
   - ?? appears to make images noisier (3713)
6. .. BLANK
   - .. option: blank other maps same as current one (*i.e.*, imag. part)
   - .. option: non-magic and non-zero blank values
   - .. option: fill in blanked from surround
   - ** DOINVERS "reversed" from TVSTAT (2863, ...)
   - ?? display values interactively as one goes (2904)
   - ?? not handling window corners correctly (3673)
7. .. SUMIM:
   - ?? other ways to get input images besides DO loop on INSEQ
   - ?? images taken as planes of one input cube: task or option
   - .. bug? (reported 10^{31} peak from it)
   - ?? excludes scratch disk for SC file (3572)

8. .. `BLSUM`
   - .. option to catalog results (???)
   - .. improve help, output data (2463-4, 2485)
   - .. go to table method like `XGAUS` (below)
   - ?? display, explain units, show rms (2728)
9. ?? `XGAUS`
   - .. various restart options: use table, separate task to build output images, ...
   - ?? error? on `NGAUS` = 4
   - ?? 2-d in, 1-d out fails?
   - ?? bug in `CENTR` maps (`NGAU`=2)
   - ?? "no plot when fitting 1 profile"
   - ?? test `EDROP`, `BDROP` for bad values (no pixels left)
10. ?? `XBASL`
    - ** Convex finds bugs in `XBASL` (2038)
    - .. rewrite in table form as for `XGAUS` (2700)
    - ?? selection by `FLUX` not good if mean of image is zero (2922)
11. ?? `XPLOT`:
    - ?? flux limit setting confusing, suggestions in (3285, 3286)
12. ?? `NINER`
    - ?? operator `KRSH` fails (2314)
    - ?? help file badly spelled (2315)
    - ?? operator WALL ends with bad minimum value (2316)
13. ?? `IMMOD`, `UVMOD`, `CCMOD` — Clean up:
    - ?? `IMMOD`: `BMAJ`, `BMIN` = radii in asec, not axes
    - ?? `UVMOD`: divide by 0.0 in `BESSEL` for `DISK` option??
    - ?? `CCMOD` doesn't handle input table correctly (2206)
    - .. rewrite `CCMOD` (see Benson's version); pixels may be better than asec (???)
    - ?? error in position angle input, POINT mode confusing, inputs get integerized (2775)
14. .. `IMFLT` fails? (2433)
15. .. Rewrite `XTRAN` to use `ST` extension files
    - ?? explain what `NPOINTS` is used for
    - ?? documentation confusing (2676)
16. ?? Task to find, fit and classify sources.
    - ?? use methods, *et al.* from fitting tasks
17. ?? `IMFIT`, `JMFIT`:
    - ?? combine two tasks into one
    - ?? `DOWID(2`–n`)` ignored on Convex?
    - ?? `JMFIT` convergence criteria too lenient (1763)
    - ?? raise coding to standards
    - ?? accept initial guesses for 0-level, slope
    - ?? solution outside field (2425)
    - ?? `JMFIT` bad errors, answers at low S/N (2592, ...)
    - ?? add `PRTLEV`, bigger field (2425, 3112, 3468)
    - ?? poor response to bad window (3645)
    - ?? fits center position despite `DOPOS` (3745)
    - ** extra garbage characters in display (3675, 3745)

18. `??` Improved Geometric Capabilities:
    - `??` `HGEOM` blows up on high (10^9) brightnesses
    - `??` `HGEOM` too verbose on progress messages (3299)
    - `??` speed up `LGEOM`
    - `??` `LGEOM` shifts zero point 0.5 pixels (2502)
    - `..` combine `LGEOM`, `PGEOM`, and `HGEOM` 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`)
    - `??` add "spherical cube" geometry (from COBE project)
    - `..` should correct fluxes in Jy/pixel cases (3222)

19. `..` Rewrite `RM`:
    - `..` easy inputs
    - `..` standard or user-friendly units and code
    - `..` inconsistent failure (3339)

20. `..` Task to fill in blanked pixels: interpolate, extrapolate

21. `..` Clean up Gustaaf's line tasks
    - `..` to standards and to work as advertised
    - `..` generalize
    - `..` `IRING`: fix help (1566)
    - `..` `IRING`: format for number points too small (2549)
    - `??` `GAL`: bugs

22. `..` Clean up other line tasks: (`MOMNT`, `SMOTH`, ...)
    - `..` generalize, to standards in coding
    - `??` `SMOTH`, `MOMNT` cannot handle blanked pixels???
    - `??` `MOMNT` message re history gives wrong moment number

23. `..` Rebuild Measuring Engine as *AIPS* Task
    - `..` 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: 1^{st} part done
    - `..` digital/analog image registration using two TVs

TASKS: DISPLAY

General:

1. .. Printing tasks:
   - ?? option to go to file rather than printer (2845, 2863)
   - ?? allow concatenation of print job to previous file (3492)
   - ?? force all tasks to put date/time on page 1 (3424)
2. ** Plotting — to devices
   - ?? plot labels overlap; fix `TKPL`, `TVPL`, `QMSPL` to try to avoid
   - ?? fix `TVPL` and others to handle strings that are too long (3521, 3485)
   - ?? `TXPL` needs batch-like mode for `HI` file with no user prompt (3479)
3. ?? Star positions on plots
   - ?? add search of star catalogs to `STARS`
4. ?? Plotting — plot-file creation
   - ?? coordinate routines can abort on bad coordinates (2438)
   - ?? allow user string to be added to plot (2648)
   - ?? clean beams on plots
   - .. overlay plotted numbers on contours (2303)
   - ?? to put their parameters in history file also?
   - ?? option to put `BLC/TRC` on the plot
5. .. Fancier contouring:
   - .. bold, labeled contours (3463, others)
   - .. ingoing ticks for minima
   - ?? redefine plot to go to edges of pixel as in `GREYS` (3042)
   - .. better interpolation (3043)
6. .. False color usage in areas of:
   - .. polarization
   - .. spectral index
   - .. *uv*
   - .. spectral-line: sum(I), velocity, width
7. .. Disk space problems
   - .. seek disk with room for print files in line printer and `QMSPL`
   - .. adverb to limit plot file size: die if too much plot?

Higher priority specifics:

1. ** `POSSM`:
   - ** clarify `ANTENNAS` usage in help file (3409)
   - ** reverse logical for scalar averaging — differs from `LISTR` (3524)
   - ?? needs better x-axis labeling including relative coordinate (3616)
   - ?? `DOBAND = 3` doesn't work right (3750, 3752)
   - ?? failed to exclude `ANTENNAS` as desired (3747)
2. ?? `IMEAN`:
   - ** add Gaussian fit curve to mean/rms of histogram plot (3062)
   - .. write histogram values out as an extension table (2317)

3. .. `PRTIM`
   - .. change `FACTOR` to physical units per printed integer
   - ** add option to override `FACTOR` giving value printed as 1 (3095)
4. ?? `QMSPL`
   - ?? get blanked pixels to be pure white (2643, 3040)
   - ?? clear fonts from printer memory??? (2976)
   - ** convex landscape contours and grey do not align (3039)
   - ** add option to limit number of grey levels used (3044)
   - ?? update the form of QUIC commands used (3073)
   - ** add option to force a page eject (3588)
   - .. change to use relative plot coordinates (3035)
   - .. change to make output file more readable (3035)
5. .. `GREYS`:
   - .. use TV LUT as option
   - .. load with functype (?? — `QMSPL` offers this)
   - .. use white contour line over black grey pixel (3045)
   - ?? polarization lines as well, or maybe new task (3720)
6. .. `UVPLT`:
   - ?? to average channels
   - ?? binning options like `IMVIM`
   - .. add `SOURCES`, `FLAGVER`, etc. options (2935)
   - ?? change to set self-scaling on binned, rather than raw, data (3111)
7. ?? `SNPLT`
   - ?? plot antenna number as well as station ID (3540)
   - ** doesn't complete the last, partial page (3630)
   - ?? `SUM` seems to plot all points, not the maximum deviation (3631)
   - ?? eliminate meaningless source-file missing message (3643)
8. ** Develop TV by wire:
   - ?? make it work from CVAX to Berkeley Unix
   - ** very slow from Convex to VLA Sun (3234)
9. ** TV in windows:
   - ** X-Windows implementation of `SSS`
   - ** `SSS` uses default character size which can be too big (3214)
   - ** experiment with smaller TV, better window setup for Suns (3746)

Lower priority:

1. `??` Dicomed tasks — `DICPL`, `DICTV`, `DICTP`?
2. `??` `PLCUB`:
   - `??` string too long — check it (3521)
   - `**` option to omit the axes for each small spectrum (3691)
3. `??` `LWPLA`:
   - `??` portability of Postscript file format troubles (3680)
4. `..` Map vs map plotting (`IMVIM`):
   - `..` allow rms images, plot points with error bars (2682)
   - `..` binning options: convolve with rms gaussian???
5. `??` `DFTPL`:
   - `??` appears to require a `TIMERANG` to be specified (3030)
6. `??` `TVHXF`, `TVHLD` problems
   - `??` differ between Charlottesville and VLA??
   - `??` `TVHLD` leaves wrong channel marked as on? (3069)
7. `??` `PRTPL`
   - `??` speed — new bit routine, quick grey-scale
   - `??` line width control (for low-resolution devices)
   - `??` better grey scale options and algorithm (like `QMSPL`)
   - `??` does it still work at all?
8. `..` `PROFL`:
   - `..` Improve the computation of the vertical scaling of `PROFL` plots.
9. `..` `VBPLT`:
   - `**` doesn't work when `ANTENNAS` specified (2672)
   - `..` check use of `JULDAY`
   - `..` speed it up
   - `..` average channels option
   - `..` all baselines on one plot option with/without data
   - `..` plot points with error bars
   - `??` fails when all phases are zero (2362)
   - `??` fails on single-dish data (3017)
10. `..` `GNPLT`, `GAPLT` — (do after gain file format change):
    - `??` fails to handle time limits correctly (2201, 2203)
    - `..` capabilities of `GAPLT`
    - `..` alternate plot symbols
    - `..` other axis types and scalings (esp. "scan number")
    - `??` clear READ status
    - `??` alternate plot method (2055)
    - `??` `GAPLT` to be less sensitive about missing `AN` file (2774)
    - `??` add `STOKES` option, including `'DIFF'`, to `GAPLT` (3440)
11. `..` `PCNTR`
    - `..` accept and convert I, Q, U images also
12. `..` Convert pen plotter code to standards
    - `..` `PRFPL`: add line printer option for values (2705)
    - `..` `PRFPL`: add output to QMS (or better yet a plot file) (2754)
    - `??` make a `PENPL` to interpret plot files to pen plotters

13. .. develop MacPaint for AIPS TVs (3133)
14. .. Image storage unit and control panel
15. .. support a graphics package or two — `PGPLOT` or `MONGO`

TASKS: TAPE

Higher priority:

1. ** `FILLM`:
   - ** index identifies sources incorrectly on short drive times (3369)
   - ?? remove record-length message on Modcomp tapes (3505)
   - ** lists wrong alternate-axis information (3528)
   - ?? too slow on Convex (3527)
   - ?? `DPARM` should be added to history file (3639)
   - ?? improve English in description of shadowing in help (3732)
2. ** `FITTP`
   - .. add "verify" option
   - ** improve help file re `DONEWTAB` (2645)
   - ?? option to write *uv* files in portions: *n1* to *n2* by *n3*/file (3550, 3604)
   - .. move tape at start, before scaling *uv* data (2321)
   - ?? blows up when `HI` file missing? (3284)
   - ?? add more defenses against bad scaling, overflows (3301)
   - ?? improve EOT performance (3304)
   - ?? error writing `SN` tables — wrong column type (3644)
3. ** `IMLOD`
   - ?? skip over *uv* files (2736) and vice versa
   - ** default output class failing? (2685)
   - ** convert output name to uppercase (2805)
   - ** bug: map processing level lost between `FITTP` and `IMLOD` on `DOALL` true?
   - ** rename `NFILES` adverb to avoid conflict
   - ?? fails to read old IBM-format tapes (3038)
   - ?? fails to recognize "Pipeline" class, velocity (2297, 2298, 2349)
4. ** `UVLOD`
   - .. combine `UVLOD` and `IMLOD`
   - ** `DOALL` option for `FITS` files
   - ** convert output name to uppercase (2805)
   - ** on Convex ignoring `BCOUNT`?
   - .. add *uv*-range, time range options (2505)
   - ?? option to concatenate FITS file to existing file on disk
   - ** remove Dec-10-like "weight" random parameter and its data
5. ** `PRTTP`
   - ** doesn't detect "Pipeline" image names, `IMLOD` does???
   - ?? skip over "unrecognized" files (2677)
   - ** floating divide by zero (2696)
   - ?? problem with `DBCON`'d *uv* files (2293, 2357)
   - ?? remove record-length message on Modcomp tapes (3505)

6. ** `FILLR`
   - ?? suppress tape length warning messages (2714)
7. ** `TPHEAD`:
   - ** fails on Export format files after the first (3083, 3210, 3579)
   - ?? honor page-full conditions (2380)
8. .. Investigate troubles with blank tapes on `DOEOT`.
   - ** add to help files: `DOEOT`, `FITTP`, etc.
   - ** get VLA blank-tape fixup method for all Vaxes

Lower priority:

1. ?? Tape handling
   - .. change `AVFILE` (incl. in tasks) to skip label files without counting them.
   - .. `AVTP` - option to find file by keyword value (2629)?
2. ** Tape dummy files
   - ?? keep track of current tape position
   - ** rename from `TA` to something else
3. ?? Backups of data to be faster and more selective
   - ?? improve speed of `BAKTP`, `BAKLD` on Unix

TASKS: EXTENSION FILES

1. ?? *AIPS* table files; what next:
   - .. convert ≥ 1 image to table
   - ?? convert table to ≥ 1 image — see `XGAUS`
   - ?? translate between table and ASCII or spread-sheet formats (DIF format)
   - .. others: check *IPPS* `AUTOPHOT` list.
   - .. interactive editing task (spread sheet?)
   - ** extension copy subroutines give better messages (3206)
2. ?? `PRTAB`
   - ?? add more selection criteria (2954)
   - .. add knowledge in `PRTAB` about specific tables, *e.g.*, selection by source, flagging (3197) — done by `SNPLT` and `LISTR`
3. ?? `PRTAN`:
   - ?? add alternate print formats: sorted, Y shape (3506)
4. .. Table tools:
   - ?? allow `TACOP` to copy tables from `UV` to `MA` (3054)
   - ?? `TACOP` copies too much (3120)
   - ?? improve description, defaults of `NCOUNT` in `TACOP` (3398, 3652)
   - ?? change `TAPLT` and `TAFLG` to use math string to describe columns (3405)
   - ?? doesn't append tables as help might suggest (3437)
   - ** overwrites `CL` version 1 despite `OUTVERS` (3464)
   - ?? `INVERS` default is non-standard (3593)
   - ** `TABED` help file needs help: suggestions in (3594)
   - ** `TASAV` should die destructively if all files are not saved (3676)

5. ?? Slices:
   - ** SL2PL and SLFIT blow up (3240, 3218)
   - ?? print out values (verb?)
   - ?? display on TV like TKSLICE
   - ?? convert to tables format
   - ?? overlay plots by arc seconds not points (2717)
   - .. plot multiple offset slices
   - .. moment fit slices
   - .. find along curved tracks
   - .. other more flexible plot options, *e.g.*, log-log (2680)
   - ?? SLICE:
     - ?? option to limit interpolation order to 0, linear, ...
     - ?? make 2-d image from cube
     - ?? fails on XGAUS (.CENTR) images?
   - ?? SLFIT:
     - ?? clean up units, display (see 2795, 3019)
     - ?? fit a baseline
   - ?? SL2PL seems to refer to format revision A?? (2803)
   - ?? SL2PL makes a long display string — check it (3485)
   - ?? slice plot does not show the position angle (3486)

VERBS: APPLICATION

1. ?? TELL:
   - ?? New verb to cancel a pending TELL (3137)
   - ?? cancel pending TELLs on GO (3600)
   - ?? allow TELL to someone else's task — only QUIT (3028)
2. ?? Verb to "set TV cursor on RA,Dec" — *i.e.*, graphics box
   - ?? verb to convert RA,Dec to pixel coordinates (2748)
3. ?? Verbs like CELGAL for ecliptic-celestial/galactic coordinates
4. ?? Verb to display convolution/deconvolution of beams (2501)
5. ?? TKSET — clarify cursor positioning in the Help file
6. ?? EXTLIST:
   - ?? display slice fit results
   - ?? display the file sizes
   - ** format problems on slices (2814)
   - ?? display XYRATIO form CNTR, GREYS, ... (3710)
   - ?? add UVHGM and ISPEC to display
7. .. Verb to catalog extension files
   - .. (Add tests for primary type = desired extension type to TKSL verb, SL2PL, PRTAB, ...)
8. ?? RENAME to do more than one per invocation (3142)
9. ** MAXFIT:
   - ** fails on the Convex (2637)
   - ?? other odd behaviors (3139)

10. ?? TKSLICE
    - ?? display y-axis even if undefined units
    - ?? y-axis label often fails actually
    - ** extend plot range a bit for clarity
    - ?? loses to current image scaling (2605)
    - ?? aborts if the min equals the max (2683)
    - ?? remove PIXRANGE from TKASLICE (or use it!)
11. .. TV labeling:
    - .. clean beam
    - ** stars
    - .. new LTYPES: source name, angular scale, freq
    - ?? plot box or slice overlay, based on BLC/TRC (3061, 3558)
12. .. TV:
    - .. anti-wrap algorithm causes strange behavior at high zoom
    - .. new spiral hue/intensity LUT (1218)
    - .. TVBOX-like to set up inputs to MX
    - .. TV version of TKSLICE
    - ** change DOPOS to something else in TVMOVI
    - ?? set RA and Dec shifts with cursor (2712)
    - ?? interactive TV display of coordinates (2747)
    - .. display images aligned by coordinates (2896)
13. .. IMHEADER(n) ; QHEADER(n) (???)

VERBS: SYSTEM OR POPS

1. ?? Message files:
    - ?? add BCOUNT, ECOUNT to CLRMSG, PRTMSG (3640)
    - ?? add verb to index message file by task starts (3641)
    - ?? add verb to search/index message file by keywords (3641)
2. ?? *POPS*
    - .. continuation line (or something) for long ADVERB = *, *, *, ... statements
    - ?? bug leads to procedures being concatenated after an EDIT
      or otherwise messed up (2569)
    - ?? GO SPLIT does proc SPLITS — min match problem (2962)
3. ?? System access:
    - ?? verb to drop to job control subprocess (2210)
    - ?? verb for quick logoff?? (2210)
    - .. standards for system-dependent verbs
    - ?? verb to show available tape drives (2310)
4. ?? How to pick up new adverbs easily despite LASTEXIT
    - ?? user DEFAULT RUN file, if present, instead of loading LASTEXIT
    - ?? autoload RUN NEWPARMS to make sure new adverbs present (??)
    - ?? adverb to suppress saving LASTEXIT on EXIT, RESTART
    - ?? drop RESTART

5. ?? Batch:
   - ?? AIPSC: option to turn off checking (some procs get 0 divide?) or make response to errors optionally less drastic
   - ** reduce delay times at start-up; first loops in QMNGR
   - ?? batch jobs not delete CA files, messages
   - .. verb to submit a single task as a batch job (2211, 3707)
   - .. batch work files by user number (2615)
   - ** SUBMIT fails if two doing it at the same time (2616)
   - ?? TIMDEST failed to die when YES/NO missing in batch job (3136)
   - ** change INPUTS, TPUT to use system value to limit BATQUE adverb (3707)
6. ?? Gripe system:
   - ?? replies to users should show *AIPS* version string (3606)
   - ?? new verb to enter gripes from external disk text files (3730)
7. ?? Deletion and bad catalog entries:
   - ?? ZAP to deal with bad headers, missing CB files???
   - ?? TIMDEST to detect and handle errors better
   - ?? ALLDEST apply DOCONFRM to SAVE/GET files
   - ** ALLDEST should not destroy recent, "active" files (2699)
   - ** EXTDEST should refuse to do certain critical files, *e.g.*, SU, CL version 1 (3428, 3688)
8. ?? Providing better helps:
   - ?? verb to display HELP INDEX by keyword(s) match (3582 good ideas)
   - ?? search for string over help files (2811)
   - ?? improved categories for general HELP files
   - ?? program to make the general help files
9. ** INPUTS
   - ** adverb to start with page *n*
   - ?? limit display to selected category of parameter (CALIB, 2573)
10. ?? History file manipulation
    - ?? verb to insert a comment in the history file.
    - ?? verb to edit history file — delete by task, line numbers
    - ?? all tasks should create an empty HI file if one is missing (2640)
11. ?? RUN files:
    - ?? user/system RUN file index verb
    - ?? RUN file form for SAVE operation
    - .. 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
12. ?? Clarify *POPS* environment in GET help file — procs can be lost
13. .. FINISH should be ok at end of any line in proc
14. .. PROC(*array*) should work when called as PROC(*scalar*)
15. ?? Verb to kill a batch job???
16. .. Verbs:
    - .. FINDSPACE — find disk number with most space
    - .. FINDNAME — find image with some name parms.

17. .. Catalog: `NEXT`
    - .. return array of catalog numbers (???)
    - .. rename a set of maps to sequence the `SEQ` numbers (???)
    - ** catalog listings to go on to next disk if catalog file missing (2925)
    - .. print catalog listing directly to line printer (3459)

DOCUMENTATION

Higher priority:

1. ** *COOKBOOK*
    - ** move new general help files into *COOKBOOK*
    - ** update since last revision !!!
    - ** calibration chapter: correction in (3595)
    - ?? calibration chapter: confusion in (3690)
    - ** FITS disk usage
2. ** Help file improvements
    - ** improve system file name descriptions for `VERSION`, `INFILE`, etc.
    - ** add one-line descriptions and categories to all help files
    - ** write program to produce category-divided lists of helps
    - ** update all general help files listing tasks/verbs (2782)
    - ?? rewrite `HELP PANIC` (3632)
3. .. Add `EXPLAIN` files (non-programmers)
    - .. `UVSEN` (3258)
    - .. `XGAUS`, `BLANK`, *et al.*
    - .. many others
    - ?? calibration tasks should list tables used in the help/explain (3597)

Lower priority:

1. ** Miscellaneous:
   - ** advertise 6250 bpi better (*COOKBOOK*, Helps, ...)
   - ** Volume 2: what's left? Move it to Volume 3.
   - .. public display of `HELP INDEX`???
   - ** Volume 1:
     - ** listing of all `HELP/EXPLAIN`s most important, but probably ok
     - ** discard Chapter 1, update Chapter 2
     - .. what needed for Chapter ,
     - ** maybe rename as "*AIPS* User Reference Manual"?
     - ** do the printing with final `AIPLAS`
2. .. Programmer documentation:
   - ?? `WHATSUP` and selective UPs files
     - ?? `PUTBCK` to enforce new documentation standards
     - ?? write program, to make category-divided lists of routines
     - .. generate files of these lists
     - .. `PRNTMN` to pick them up
     - .. subroutine help library?
   - ?? *AIPS* Manager manual:
     - ?? service programs
     - ?? system configuration recommendations
     - ?? implementing various peripherals
   - .. `XREFS`:
     - ?? Vax/Convex version of `XREFS`
     - ?? Vax/Convex cross reference by task rather than individual module
3. ?? *AIPS* memos to be finalized:
   - ?? use of `EMACS` editor with *AIPS* files
   - ?? mailing List Package
   - ?? checkout System
   - ?? Fortran standards
   - .. update Gripes procedure memo
4. ?? Havlen/Fomalont "DEMO" image file?
   - ?? under the mythical user number 1?
5. .. An *AIPS* Tee-Shirt? — never a serious priority