BRL-CAD Interface Change Policy

This policy describes formal rules for changing an interface that
potentially impacts developers or users. The scope is limited to
public interfaces including developer application programming
interfaces (APIs), user application command-line interfaces (CLIs),
and graphical user interfaces (GUIs). The policy aims to balance
developer agility with interface stability.

All changes to BRL-CAD are expected to conform to this change policy.
Changes MUST either be:

    A) MINIMALLY IMPACTING, or
    B) FORMALLY DEPRECATED.

MINIMALLY IMPACTING

Changes deemed "minimally impacting" can be made at any time. For a
change to be considered as such, its effect must be strictly limited.
Most are itemized under MINIMALLY IMPACTING CHANGES. They MUST be:

    A.1) a relatively new interface

        Interfaces introduced recently are often subject to rapid
        development change. New interfaces are not subject to formal
        deprecation rules until they have been included in at least
        TWO releases without change.

    A.2) an appreciably broken interface

        Interfaces that have been unusable for at least TWO releases
        may be fixed, changed, or removed without notice. A broken
        interface is one that does not perform its intended function
        and does not have secondary utility.

    A.3) an elementary change

        Simple changes that are trivially accommodated without
        conditional logic or manual inspection can be made at will.
        It includes mechanical changes that can be automatically
        updated by a single static regular expression substitution.

        Examples include renaming, reordering parameters, adding
        optional parameters, eliminating a duplicate equivalent
        interface, adding parameters for implicit behavior, and
        removing unused parameters.

FORMALLY DEPRECATED

Changes not minimally impacting must follow formal deprecation
process. This defers significant changes to major release points or
requires public notification in advance. Changes are documented in
this file first as DEPRECATED CHANGES then later as OBSOLETED CHANGES.
An interface may be changed:

    B.1) during a major release (e.g. from 7.*.* to 8.*.*)

        Any change may be made without notice. Major version number
        releases imply intrinsic incompatibility or interface change.

    B.2) during a minor release (e.g., from 7.26.* to 7.28.*)

        The interface must be publicly deprecated beforehand with
        advance notice given in at least TWO minor releases and after
        at least 90 days elapsed since initial release announcement.

Public interfaces scheduled for change should be noted in this file
and visibly marked in the source code. This marking may be the
DEPRECATED keyword on function declarations, #warning "DEPRECATED ..."
pre-processor statements, @DEPRECATED source code comments, and
combinations thereof.

Where usage is not adversely affected, a run-time statement may be
displayed (typically "DEPRECATION WARNING: ..."). All call references
and documentation should be updated prior to obsoleting.

EXAMPLES

Example #1: rt_shootray() removal

It's decided during 7.50.3 development to remove the rt_shootray()
function. That does NOT qualify as "minimally impacting" because
there's no equivalent replacement and rt_shootray() has been published
and documented in more than two releases. The function gets listed as
DEPRECATED in the CHANGES file, marked as DEPRECATED in the API
header, and is published via the 7.50.4 release.

The soonest that function could be removed / obsoleted would be in
7.54.0 during 7.53.* development provided more than 90 days had passed
since the intiial announcement. It could NOT be removed in 7.54.2 as
that's a patch version, prior to 7.54, nor during 7.54.0 if less than
90 days had passed since 7.50.6 was posted.

Example #2: bu_log() mod

It's decided during 7.48.1 development to modify bu_log() by adding an
additional optional enum parameter denoting a message type, e.g.,
bu_log(INFO, ...). This change is considered "minimally impacting"
because it can be characterized by a simple regular expression (e.g.,
"s/bu_log\(/bu_log(INFO, /g)" and calling codes are trivially

accommodated. All calls to bu_log() should be updated to the new form
prior to change announcement.

The function could be changed at any time so long as it's documented
under MINIMALLY IMPACTING CHANGES.


```
************************************************************************
***                       DEPRECATED CHANGES                      ***
************************************************************************
```
                     (reverse chronological order)

The interfaces announced below are scheduled to significantly change
or be removed. They are categorized by the release in which
deprecation was first announced. If the inteface change involved a
removal or transition, both the original and new interface names are
generally listed for reference.

Items marked with a "'" (single quote) are undocumented and may be
removed at any time.

7.28
----

include/vmath.h
        VCOMB3, VCOMB3N, VJOIN4
        Removed as inconsistent and unused API [deprecated 7.28]

MGED commands
      ?devel, ?lib, aproposdevel, aproposlib, %, animmate, db_glob,
      debugbu, debugdir, debuglib, debugmem, debugnmg, expand,
      loadtk, match, memprint, preview, regdebug, regdef, rmats, rrt,
      savekey, shaded_mode, sync
      Removed as part of distillation effort [deprecated 7.28]

7.26
----
ray tracing tools
      lgt : functionally replaced by nirt
      rtcell', rtfrac', rtpp, rtrad', rtrange, rtray, rtregis, rtsil'
      Removed as part of distillation effort [deprecated 7.26]
converter tools
      cy-g, euclid-g, euclid_format', euclid_unformat', g-euclid,
      g-euclid1', g-tankill, intaval-g.py, viewpoint-g : obsolete formats
      plot3-X, plot3-hpgl, plot3-tek : obsolete interface, see overlay
command
      plot3debug, xyz-plot3 : see plot3-asc,asc-plot3
      bot-bldxf', bot_shell-vtk, g-nmg, nmg-bot, nmg-rib, nmg-sgp',
      poly-bot, rt_bot_faces, : primitive-specific converters
      Removed as part of distillation effort [deprecated 7.26]
image tools
      cmap-fb, fb-cmap, fbcmrot : colormap support obsolete
      fbed, cell-fb : outside scope
      fbscanplot, polar-fb, pp-fb, bw-imp, pixinfo.sh : obsolete

```
      png_info : incorporating into icv
      pixpaste : outside scope, license
      alias-pix' : incorporating into icv
      asc2pix' : incorporating into icv
      pix-yuv', yuv-pix' : obsolete non-standard format
      texturescale : obsolete implementation
      Removed as part of distillation effort [deprecated 7.26]
video & animation tools
      anim_*', fbanim, chan_add', chan_mult, chan_permute,
      pixflip-fb' : outside scope
      pixfields', pixfieldsep' : outside scope
      orbit.sh, rtwalk, scriptsort, script-tab', tabinterp, tabsup,
      azel, bary
      Removed as part of distillation effort [deprecated 7.26]
signal analysis tools
      a-d', d-a', bw-a', i-a', u-a' : incorporating into cv
      d-a', d-bw', d-f', d-i', d-u' : incorporating into cv
      a-d', bw-d', c-d', f-d', i-d', u-d' : incorporating into cv
      f-d', f-i', d-f', i-f', u-f', u-bw' : incorporating into cv
      d2-c', double-asc' : incorporating into cv
      Removed as part of distillation effort [deprecated 7.26]
infrared & shapefactor tools
      all_sf', if-X, ifdisp, pictx, showterm, firpass, secpass, shapefact
      Removed as part of distillation effort [deprecated 7.26]
misc tools
      fix_polysolids' : obsolete primitive
      remapid : superseded by reid+remat
      buffer : unnecessary network/stream buffering tool
      hex : superseded by hexdump
      Removed as part of distillation effort [deprecated 7.26]
include/bu/ptbl.h
        BU_PTBL_BASEADDR, BU_PTBL_LASTADDR, BU_PTBL_END
        Removed as private implementation detail [deprecated 7.26
include/bu/hash.h
      bu_hash_tbl_find, bu_set_hash_value, bu_get_hash_value,
bu_get_hash_key,
      bu_hash_tbl_add, bu_hash_tbl_print, bu_hash_tbl_free,
bu_hash_tbl_first,
      bu_hash_tbl_next, bu_hash_tbl_traverse, public structs
bu_hash_entry and
      bu_hash_tbl will be made private.
      Replaced with new API [deprecated 7.26]
include/bu/cmd.h
      remove struct bu_cmdhist and struct bu_cmdhist_obj [deprecated
7.26]
      BU_CMDHIST_NULL, BU_CMDHIST_OBJ_NULL, bu_cmdhist_histor,
bu_cmdhist_add,
      bu_cmdhist_curr, bu_cmdhist_nest, bu_cmdhist_prev [deprecated 7.26]
fb-rle, rle-fb, bw-rle, pix-rle, rle-pix
      All tools focused specifically on the RLE image format. [deprecated
7.26]
nirt
      -T - use LIBRT_BOT_MINTIE environment variable instead [deprecated
7.26]
```

all global variables
        global variables are no longer considered published public API
[deprecated 7.26]
        bn_mat_identity -> MAT_INIT_IDN or MAT_IDN() or NULL
include/bn.h
        tp_setup, no longer needs to be public API [deprecated 7.26]
include/raytrace.h
        curve_to_tcl_list
        db_full_path_appendresult tcl_obj_to_int_array
        tcl_obj_to_fastf_array tcl_list_to_int_array
        tcl_list_to_fastf_array *_tcl_*, removal of all tcl-specific
        API functions [deprecated 7.26]
        db_regexp_match_all() -> db_ls() [deprecated 7.26]
include/rt/solid.h
        shouldn't be public API - this level of detail belongs inside the
display
        manager [deprecated 7.26]
include/ged/defines.h
        remove struct ged_drawable - shouldn't be public API [deprecated
7.26]
        remove freesolid from struct ged - exposes struct solid [deprecated
7.26]
include/ged/view.h
        remove current forms of dl_erasePathFromDisplay and invent_solid -
they
        expose the struct solid type [deprecated 7.26]
include/tclcad.h
        tclcad_bn_mat_print tclcad_rt_parse_ray tclcad_rt_pr_cutter
        tclcad_rt_pr_hit tclcad_rt_rt tclcad_rt_import_from_path, removal
of all
        tcl-specific API functions [deprecated 7.26]
pixcut, pixpaste
        copyright cleanup [deprecated 7.26]
librt, fast4-g
        removal of CLINE entity support [deprecated 7.26]
mged
        kill, killtree, killall, killrefs - replaced with rm command
[deprecated 7.26]

        rm comb obj1 obj2 comb1 ... -> new behavior: remove objects and
empty combs from .g
        original functionality replaced with rm comb/obj* comb/comb1 ...
syntax [deprecated 7.26]

        expand -> replaced by search -name <pattern> (previous docs
indicating matching of
        expand was regex were wrong - uses bu_fnmatch.) [deprecated 7.26]

        pathlist, paths -> replaced by search [deprecated 7.26]
burst
        remove termlib-based interactive menu interface [deprecated 7.26]

7.24

```
fbed, pp-fb
     removes termcap use, no known users [deprecated 7.24]
include/raytrace librt
     db_full_path_list_add(), db_free_full_path_list() [deprecated 7.24]
     db_search_formplan(), db_search_freeplan(), db_search_full_paths()
[deprecated 7.24]
     db_search_unique_objects(), struct db_full_path_list [deprecated
7.24]
src/irprep
     all_sf, firpass, ir-X, irdisp, pictx, secpass, shapefact, showterm
[deprecated 7.24]
include/raytrace.h librt
     RT_DBHASH and RT_DBNHASH [deprecated 7.24]


7.22
----
include/raytrace.h librt
     nmg_model_break_e_on_v -> nmg_break_e_on_v [deprecation 7.22]
     RT_GET_TREE -> BU_GET [deprecation 7.22]
     RT_FREE_TREE -> BU_PUT [deprecation 7.22]
include/bu.h
     bu_parse_mm() [deprecated 7.22]
mged
     em, e_muves, l_muves, lm, read_muves, and t_muves MUVES-specific
commands [deprecated 7.22]


7.20
----
tclscripts/lib
     Mged, Database, Db, Dm, Drawable, Display, QuadDisplay, View -> Ged
[deprecated 7.20]
librt
     bspline primitive [deprecated 7.20]
     poly primitive [deprecated 7.20]
     hf primitive [deprecated 7.20]
include/bu.h
     bu_vls_init_if_uninit() -> bu_vls_init() [deprecated 7.20]
GNU Autotools configure compatibility script
     ./configure -> cmake . [deprecated 7.20]
include/raytrace.h
     rt_load_attrs() -> rt_gettrees_and_attrs() or
db5_import_attributs() [deprecated 7.20]
     db_regexp_match() -> !bu_fnmatch() [deprecated 7.20]


7.18
----
include/raytrace.h rt_comb_internal members
     region_id -> region_id attribute [deprecated 7.18]
     aircode -> air attribute [deprecated 7.18]
     GIFTmater -> material_id attribute [deprecated 7.18]
     los -> los attribute [deprecated 7.18]
bu.h xdr API
     BU_GLONGLONG() -> ntohll() [deprecated 7.18]
     BU_GLONG() -> ntohl() [deprecated 7.18]
```

```
        BU_GSHORT() -> ntohs() [deprecated 7.18]
        bu_gshort() -> ntohs() [deprecated 7.18]
        bu_glong() -> ntohl() [deprecated 7.18]
        bu_pshort() -> htons() [deprecated 7.18]
        bu_plong() -> htonl() [deprecated 7.18]
        bu_plonglong() -> htonll() [deprecated 7.18]
db.h
        rt_fastf_float() -> ntohf() [deprecated 7.18]
        rt_mat_dbmat() -> htonf() [deprecated 7.18]
        rt_dbmat_mat() -> ntohf() [deprecated 7.18]
mged
        ?(*) -> ? -(*) [deprecated 7.18]
        apropos(*) -> apropos -(*) [deprecated 7.18]
        dbconcat -> db concat [deprecated 7.18]
        dbupgrade -> db upgrade [deprecated 7.18]
        dbversion -> db version [deprecated 7.18]
        dbfind -> search [deprecated 7.18]
        debug* -> debug [deprecated 7.18]
        comb_std -> comb [deprecated 7.18]
        comb_color -> comb [deprecated 7.18]
        combmem -> comb [deprecated 7.18]
        kill(*) -> kill [deprecated 7.18]
        rotobj -> rot [deprecated 7.18]
        qvrot -> rot -q -v [deprecated 7.18]
        qorot -> rot -q [deprecated 7.18]
        ([amov])rot -> rot -([amv]) [deprecated 7.18]
        ([op])scale -> sca -(p) [deprecated 7.18]
        ([op])translate -> tra -(p) [deprecated 7.18]
        nmg_(*) -> nmg (*) [deprecated 7.18]
        bot_(*) -> bot (*) [deprecated 7.18]
        [so]ed -> edit [deprecated 7.18]
        [tr]ed -> edit -t [deprecated 7.18]
        ls -oA -> ls -O [deprecated 7.18]
        draw -oA -> draw -O [deprecated 7.18]
        erase -oA -> erase -O [deprecated 7.18]
        erase_all -> erase -r [deprecated 7.18]
        move_all -> move -r [deprecated 7.18]
        query_ray -> nirt [deprecated 7.18]
        vdraw -> draw -v [deprecated 7.18]
        vnirt -> nirt -v [deprecated 7.18]
        vquery_ray -> nirt -v [deprecated 7.18]
        xpush -> push -x [deprecated 7.18]


7.16
----
struct bu_structparse 'i' format
        'i' -> '%p' [deprecated 7.16]
reserved attributes and case-sensitivity
        id -> region_id [deprecated 7.16]
        GIFTmater -> material_id [deprecated 7.16]
        GIFT_MATERIAL -> material_id [deprecated 7.16]
        mat -> material_id [deprecated 7.16]
        AIRCODE -> air [deprecated 7.16]
        rgb -> color [deprecated 7.16]
```

```
      oshader -> shader [deprecated 7.16]
include/raytrace.h
      rt_prep_timer() -> bu_timer() [deprecated 7.16]
      rt_get_timer() -> bu_elapsed() [deprecated 7.16]


7.14
----
mged
      src/tclscripts/mged/bots.tcl [deprecated 7.14]

7.12
----
include/raytrace.h
      rt_functab size -> growing ft_label and new callbacks [deprecated
7.12]
src/rt/viewarea.c
      terminology and output format [deprecated 7.12]

pre 7.0
-------
include/raytrace.h
      struct hit.hit_point -> RT_HIT_POINT [deprecated pre-7.0]
      struct hit.hit_normal -> RT_HIT_NORMAL [deprecated pre-7.0]



**********************************************************************
***                      OBSOLETED CHANGES                       ***
**********************************************************************
                    (reverse chronological order)

7.28.0
------

libmultispectral, rttherm, ssamp-bw, ssampview, ssampview.tcl
      removed, not working in testing [minimally impacting]

7.26.0
------
dbcp
      dbcp -> dd [deprecated 7.18]
pov (mged)
      removed, undocumented command with many alternatives [minimally
impacting]
polybinout (mged)
      removed, undocumented command, use plot [minimally impacting]
pl (mged)
      removed, use plot [minimally impacting]
conf.h
      removed - replaced with common.h [deprecated 7.0]
UtahRLE image tools
      no longer installed by default with BRL-CAD - not used directly by
      BRL-CAD tools [minimally impacting]
Tcl in libbu and libbn
      no longer utilize or require Tcl [dependency eliminated]
```

Tcl/Tk man pages
     no longer installed by default with BRL-CAD when the bundled Tcl/Tk
is used
     to build [minimally impacting]
include/dg.h
     implementation detail no longer being exposed, use libged
[deprecated 7.22]
autogen.sh && configure
     GNU Autotools build system -> CMake build system [deprecated 7.20]
Dunn camera and Canon printer tools
     dunncolor [deprecated 7.16]
     dunnsnap [deprecated 7.16]
     canonize [deprecated 7.16]
genptr_t/GENPTR_NULL
     genptr_t -> void* [deprecated 7.16]
include/bu.h
     bu_argv0() -> bu_basename(bu_argv0_full_path(), NULL) [deprecated
7.16]
include/dm_color.h
     dm_color.h -> dm.h [deprecated 7.14]
include/fb.h
     FB_WPIXEL -> fb_wpixel [deprecated 7.14]
include/raytrace.h
     rt_fdiff -> NEAR_ZERO [deprecated 7.14]
     rt_reldiff -> NEAR_ZERO [deprecated 7.14]
     DIR_* -> RT_DIR_* [deprecated 7.14]
     RT_HIT_NORM -> RT_HIT_NORMAL [deprecated 7.12]
include/vmath.h
     VADD2_2D -> V2ADD2 [deprecated 7.14]
     VSUB2_2D -> V2SUB2 [deprecated 7.14]
     MAGSQ_2D -> MAG2SQ [deprecated 7.14]
     VDOT_2D -> V2DOT [deprecated 7.14]
     VMOVE_2D -> V2MOVE [deprecated 7.14]
     VSCALE_2D -> V2SCALE [deprecated 7.14]
     VJOIN1_2D -> V2JOIN1 [deprecated 7.14]
liborle
include/orle.h
     remove liborle and the tools using it, fb-orle, orle-fb, orle-pix
and
     pix-orle [deprecated 7.20]
mged
     make_bb -> bb [deprecated 7.16]
     tops -g -u -> now default behavior [deprecated 7.14]
     -n option -> -c option [deprecated 7.14]
     per_line [deprecated 7.14]
SGI-specific tools
     pl-sgi -> pl-fb [deprecated 7.16]
src/gtools
     g_diff, g_lint, g_qa, g_transfer -> gdiff, glint, gqa, gtransfer
[deprecated 7.14]
src/librt/cmd.c
     rt_split_cmd() -> bu_argv_from_string() [deprecated 7.12]
any-png.sh
     use pix tools [deprecated 7.16]

```
cadbug.sh
      use sf.net tracker [deprecated 7.16]
cray.sh
      obsolete hardware [deprecated 7.16]
pixwrite.sh
      obsolete hardware [deprecated 7.16]
pixread.sh
      obsolete hardware [deprecated 7.16]
sgisnap.sh
      obsolete hardware [deprecated 7.16]
librtserver and Java Native Interface (JNI) bindings
      removed, unused and undocumented, modern approach would be to
      use a tool such as swig to generate bindings [minimally impacting]


7.24.2
------
.pl file suffix
      .pl -> .plot3 [deprecated 7.16]
*-pl
      *-pl -> *-plot3 [deprecated 7.16]
pl*
      pl* -> plot3* [deprecated 7.16]


7.24.0
------
include/bu.h
      bu_get_public_cpus() [deprecated 7.16]
      bu_get_load_average() [deprecated 7.12]
      bu_fopen_uniq() -> fopen() [deprecated 7.14]
src/other/jove
      jove -> emacs [deprecated 7.14]


7.22.0
------
include/bu.h
      %S format specifier -> %V format specifier for bu_vls [deprecated
7.14]


7.20.2
------
cat-fb
      obsolete hardware
include/vmath.h
      ELEMENTS_PER_PT -> ELEMENTS_PER_POINT [deprecated 7.12]
      HVECT_LEN -> ELEMENTS_PER_HVECT [deprecated 7.12]
      HPT_LEN -> ELEMENTS_PER_HPOINT [deprecated 7.12]


7.20.0
------
include/bu.h
      bu_mro and related macros -> bu_attribute_value_set


7.18.2
------
```

```
include/raytrace.h
      RT_HIT_NORM -> RT_HIT_NORMAL [deprecated pre-7.0]
g-shell.rect
      g-shell.rect renamed to g-shell-rect [minor tool rename]

7.18.0
------
include/raytrace.h
      db_free_external -> bu_free_external [deprecated pre-7.0]
include/wdb.h
      mk_fastgen_region() -> mk_comb() [deprecated 7.12]
src/librt/bomb.c
      rt_bomb() -> bu_bomb() [deprecated 7.10]
include/machine.h
      machine.h -> common.h && bu.h [deprecated 7.10]
src/vas4
      vas4 [deprecated 7.12]

7.16.4
------
include/raytrace.h
      get_solidbitv() -> rt_get_solidbitv() [deprecated 7.16]

7.14.4
------
include/pkg.h
      uses size_t for lengths in API calls
include/bu.h
      bu_association() [unused]

7.14.0
------
include/raytrace.h
      GET_HITMISS -> NMG_GET_HITMISS
mged
      edcolor -> color -e
include/vmath.h
      PI -> M_PI
      M_SQRT2_DIV2 -> M_SQRT1_2

7.12.6
------
mged
      binary -> bo [rename]

7.12.4
------
include/mater.h
      rt_material_head -> rt_material_head()  [deprecated 7.12]
include/raytrace.h
      removed iterator from NMG_CK_HITMISS_LIST
include/bu.h
      BU_QFLSTR -> BU_FLSTR
```

```
7.12.2
------
include/wdb.h
     mk_trc() -> mk_trc_h() and mk_trc_top() [deprecated pre-7.0]
     mk_bsolid() [deprecated pre-7.0]
     mk_bsurf() [deprecated pre-7.0]
     mk_strsol() -> mk_dsp(), mk_ebm(), mk_vol(), mk_submodel()
[deprecated pre-7.0]
     mk_rcomb(), mk_fcomb(), mk_memb() -> mk_lcomb() and mk_addmember()
[deprecated pre-7.0]
     mk_fwrite_internal() [deprecated pre-7.0]

7.12.0
------
include/common.h
     NATURAL_IEEE -> bu_byteorder() == BU_BIG_ENDIAN ||
defined(WORDS_BIGENDIAN)
     REVERSE_IEEE -> bu_byteorder() == BU_LITTLE_ENDIAN
include/bu.h
     bu_log(char *, ...) -> bu_log(const char *, ...) [const]
     bu_flog(FILE *, char *, ...) -> bu_flog(FILE *, const char *, ...)
[const]
     bu_vls_printf(struct bu_vls *, char *) -> bu_vls_printf(struct
bu_vls *, const char *) [const]
     bu_vls_sprintf(struct bu_vls *, char *) -> bu_vls_sprintf(struct
bu_vls *, const char *) [const]
include/wdb.h
     removed mk_poly() [deprecated pre-7.0]
     removed mk_polysolid() [deprecated pre-7.0]
     removed mk_fpoly() [deprecated pre-7.0]
     removed write_shell_as_polysolid() [deprecated 6.0]
include/bu.h
     char *bu_brlcad_path() -> const char *bu_brlcad_path() [const]
include/bn.h
     bn_mat_zero() -> MAT_ZERO() [deprecated pre-7.0]
     bn_mat_idn() -> MAT_IDN() [deprecated pre-7.0]
     bn_mat_copy() -> MAT_COPY() [deprecated pre-7.0]
include/compat4.h
     compat4.h -> bu.h && bn.h [deprecated 5.0]
include/raytrace.h
     rt_overlap_quietly() -> struct application.a_logoverlap =
rt_silent_logoverlap [deprecated pre 7.0]
include/bu.h
     bu_brlcad_path() -> bu_brlcad_root() || bu_brlcad_data()
[deprecated 7.4]
     bu_tcl_brlcad_path() -> bu_tcl_brlcad_root() ||
bu_tcl_brlcad_data() [deprecated 7.4]
include/fb.h
     fb_log(char *fmt) -> fb_log(const char *fmt) [const]
include/noalias-prag.h
     removed [non-stdc]
include/noalias.h
     removed [non-stdc]
src/librt/wdb_obj.c -> src/librt/db_obj.c
```

```
      removed wdb_tree_cmd(), added dgo_tree_cmd() [rename]
mged
      dbbinary -> binary [rename]


7.10.4
------
include/msr.h [pre 7.0]
      msr.h -> bu.h
include/rtlist.h [pre 7.0]
      rtlist.h -> bu.h
include/rtstring.h [pre 7.0]
      rtstring.h -> bu.h
include/shortvect.h [pre 7.0]
include/shortvect-pr.h [pre 7.0]


7.10.2
------
include/raytrace.h
      rt_version -> rt_version() [private]
include/[library].h (several)
      [library]_version -> [library]_version() [private]



**********************************************************************
***                   MINIMALLY IMPACTING CHANGES                 ***
**********************************************************************
                    (forward chronological order)


All minimally impacting changes are listed by release as regular
expressions.  Unless noted otherwise, expressions are shown using Perl
syntax (i.e., the '(', ')', and '|' characters pertain to
subexpression captures, escaping with '\' matches literally.
Expressions should apply via:

perl -0777 -pi -e 'EXPRESSION' FILE

To apply an expression to an entire source tree, the following pattern
may work:

find . -type f -not -path "*.svn/*" -regex '.*\(c\|cpp\|cxx\|h\|hpp\)$' -
exec perl -0777 -pi -e 'EXPRESSION' {} \;

Expressions are minimally tested, use with caution.  Make a backup.



6.0 (sed lines)
---
g/struct structparse/s//struct bu_structparse/g
g/struct rt_mapped_file/s//struct bu_mapped_file/g
g/struct rt_list/s//struct bu_list/g
g/struct histogram/s//struct bu_hist/g
g/complex  /s//bn_complex_t /g
g/GETSTRUCT/s//BU_GETSTRUCT/g
g/GETUNION/s//BU_GETUNION/g
```

```
g/nmg_tbl.*(\(.*\), TBL_INIT[ ]*, \(.*\))/s//bu_ptbl_init(\1, 64, "\1")/
g/nmg_tbl.*(\(.*\), TBL_RST[ ]*, \(.*\))/s//bu_ptbl_reset(\1)/
g/nmg_tbl.*(\(.*\), TBL_INS[ ]*, \(.*\))/s//bu_ptbl_ins(\1, \2)/
g/nmg_tbl.*(\(.*\), TBL_LOC[ ]*, \(.*\))/s//bu_ptbl_locate(\1, \2)/
g/nmg_tbl.*(\(.*\), TBL_ZERO[ ]*, \(.*\))/s//bu_ptbl_zero(\1, \2)/
g/nmg_tbl.*(\(.*\), TBL_INS_UNIQUE[ ]*, \(.*\))/s//bu_ptbl_ins_unique(\1,
\2)/
g/nmg_tbl.*(\(.*\), TBL_RM[ ]*, \(.*\))/s//bu_ptbl_rm(\1, \2)/
g/nmg_tbl.*(\(.*\), TBL_CAT[ ]*, \(.*\))/s//bu_ptbl_cat(\1, \2)/
g/nmg_tbl.*(\(.*\), TBL_FREE[ ]*, \(.*\))/s//bu_ptbl_free(\1)/
g/nmg_tbl/s//bu_ptbl/g
g/nmg_ptbl/s//bu_ptbl/g
g/MSR_UNIF/s//BN_UNIF/g
g/MSR_GAUSS/s//BN_GAUSS/g
g/MSR_CK/s//BU_CK/g
g/msr_unif/s//bn_unif/g
g/msr_gauss/s//bn_gauss/g
g/RT_CKMAG/s//BU_CKMAG/g
g/RT_TOL_MAGIC/s//BN_TOL_MAGIC/g
g/RT_CK_TOL/s//BN_CK_TOL/g
g/RT_VECT_ARE_PARALLEL/s//BN_VECT_ARE_PARALLEL/g
g/RT_VECT_ARE_PERP/s//BN_VECT_ARE_PERP/g
g/rt_badmagic/s//bu_badmagic/g
g/RT_SETJUMP/s//BU_SETJUMP/g
g/RT_UNSETJUMP/s//BU_UNSETJUMP/g
g/rt_twopi/s//bn_twopi/g
g/rt_halfpi/s//bn_halfpi/g
g/rt_quarterpi/s//bn_quarterpi/g
g/rt_invpi/s//bn_invpi/g
g/rt_inv2pi/s//bn_inv2pi/g
g/rt_inv4pi/s//bn_inv4pi/g
g/rt_inv255/s//bn_inv255/g
g/rt_degtorad/s//bn_degtorad/g
g/rt_radtodeg/s//bn_radtodeg/g
g/RT_HISTOGRAM_MAGIC/s//BU_HIST_MAGIC/g
g/RT_CK_HISTOGRAM/s//BU_CK_HIST/g
g/RT_HISTOGRAM_TALLY/s//BU_HIST_TALLY/g
g/rt_hist_free/s//bu_hist_free/g
g/rt_hist_init/s//bu_hist_init/g
g/rt_hist_range/s//bu_hist_range/g
g/rt_hist_pr/s//bu_hist_pr/g
g/RT_LIST_HEAD_MAGIC/s//BU_LIST_HEAD_MAGIC/g
g/RT_LIST_NULL/s//BU_LIST_NULL/g
g/RT_LIST_INSERT/s//BU_LIST_INSERT/g
g/RT_LIST_APPEND/s//BU_LIST_APPEND/g
g/RT_LIST_DEQUEUE/s//BU_LIST_DEQUEUE/g
g/RT_LIST_PUSH/s//BU_LIST_PUSH/g
g/RT_LIST_POP/s//BU_LIST_POP/g
g/RT_LIST_INSERT_LIST/s//BU_LIST_INSERT_LIST/g
g/RT_LIST_APPEND_LIST/s//BU_LIST_APPEND_LIST/g
g/RT_LIST_IS_EMPTY/s//BU_LIST_IS_EMPTY/g
g/RT_LIST_NON_EMPTY/s//BU_LIST_NON_EMPTY/g
g/RT_LIST_NON_EMPTY_P/s//BU_LIST_NON_EMPTY_P/g
g/RT_LIST_IS_CLEAR/s//BU_LIST_IS_CLEAR/g
```

```
g/RT_LIST_UNINITIALIZED/s//BU_LIST_UNINITIALIZED/g
g/RT_LIST_INIT/s//BU_LIST_INIT/g
g/RT_LIST_MAGIC_SET/s//BU_LIST_MAGIC_SET/g
g/RT_LIST_MAGIC_OK/s//BU_LIST_MAGIC_OK/g
g/RT_LIST_MAGIC_WRONG/s//BU_LIST_MAGIC_WRONG/g
g/RT_LIST_IS_HEAD/s//BU_LIST_IS_HEAD/g
g/RT_LIST_NOT_HEAD/s//BU_LIST_NOT_HEAD/g
g/RT_CK_LIST_HEAD/s//BU_CK_LIST_HEAD/g
g/RT_LIST_NEXT_IS_HEAD/s//BU_LIST_NEXT_IS_HEAD/g
g/RT_LIST_NEXT_NOT_HEAD/s//BU_LIST_NEXT_NOT_HEAD/g
g/RT_LIST_FOR2/s//BU_LIST_FOR2/g
g/RT_LIST_FOR/s//BU_LIST_FOR/g
g/RT_LIST_WHILE/s//BU_LIST_WHILE/g
g/RT_LIST_FIRST_MAGIC/s//BU_LIST_FIRST_MAGIC/g
g/RT_LIST_LAST_MAGIC/s//BU_LIST_LAST_MAGIC/g
g/RT_LIST_PNEXT_PNEXT/s//BU_LIST_PNEXT_PNEXT/g
g/RT_LIST_PNEXT_PLAST/s//BU_LIST_PNEXT_PLAST/g
g/RT_LIST_PLAST_PNEXT/s//BU_LIST_PLAST_PNEXT/g
g/RT_LIST_PLAST_PLAST/s//BU_LIST_PLAST_PLAST/g
g/RT_LIST_PNEXT_CIRC/s//BU_LIST_PNEXT_CIRC/g
g/RT_LIST_PPREV_CIRC/s//BU_LIST_PPREV_CIRC/g
g/RT_LIST_PLAST_CIRC/s//BU_LIST_PPREV_CIRC/g
g/RT_LIST_MAIN_PTR/s//BU_LIST_MAIN_PTR/g
g/RT_LIST_PNEXT/s//BU_LIST_PNEXT/g
g/RT_LIST_PLAST/s//BU_LIST_PLAST/g
g/RT_LIST_LAST/s//BU_LIST_LAST/g
g/RT_LIST_PREV/s//BU_LIST_PREV/g
g/RT_LIST_FIRST/s//BU_LIST_FIRST/g
g/RT_LIST_NEXT/s//BU_LIST_NEXT/g
g/rt_log/s//bu_log/g
g/rt_add_hook/s//bu_add_hook/g
g/rt_delete_hook/s//bu_delete_hook/g
g/rt_putchar/s//bu_putchar/g
g/rt_flog/s//bu_flog/g
g/rt_identify_magic/s//bu_identify_magic/g
g/rt_identity/s//bn_mat_identity/g
g/rt_prmem/s//bu_prmem/g
g/rt_strdup/s//bu_strdup/g
g/rt_malloc/s//bu_malloc/g
g/rt_calloc/s//bu_calloc/g
g/rt_free/s//bu_free/g
g/rt_byte_roundup/s//bu_malloc_len_roundup/g
g/rt_mem_barriercheck/s//bu_mem_barriercheck/g
g/rt_open_mapped_file/s//bu_open_mapped_file/g
g/rt_close_mapped_file/s//bu_close_mapped_file/g
g/RT_CK_MAPPED_FILE/s//BU_CK_MAPPED_FILE/g
g/noise_init/s//bn_noise_init/g
g/noise_perlin/s//bn_noise_perlin/g
g/noise_vec/s//bn_noise_vec/g
g/noise_fbm/s//bn_noise_fbm/g
g/noise_turb/s//bn_noise_turb/g
g/rt_pri_set/s//bu_nice_set/g
g/rt_cpuget/s//bu_cpulimit_get/g
g/rt_cpuset/s//bu_cpulimit_set/g
```

```
g/rt_avail_cpus/s//bu_avail_cpus/g
g/rt_parallel/s//bu_parallel/g
g/rt_struct_export/s//bu_struct_export/g
g/rt_struct_import/s//bu_struct_import/g
g/rt_struct_put/s//bu_struct_put/g
g/rt_struct_get/s//bu_struct_get/g
g/rt_gshort/s//bu_gshort/g
g/rt_glong/s//bu_glong/g
g/rt_pshort/s//bu_pshort/g
g/rt_plong/s//bu_plong/g
g/rt_struct_buf/s//bu_struct_wrap_buf/g
g/rt_structparse/s//bu_struct_parse/g
g/rt_structprint/s//bu_struct_print/g
g/rt_vls_structprint/s//bu_vls_struct_print/g
g/offsetofarray/s//bu_offsetofarray/g
g/ FUNC_NULL/s// BU_STRUCTPARSE_FUNC_NULL/g
g/rt_external/s//bu_external/g
g/RT_EXTERNAL_MAGIC/s//BU_EXTERNAL_MAGIC/g
g/RT_EXTERN/s//BU_EXTERN/g
g/RT_INIT_EXTERNAL/s//BU_INIT_EXTERNAL/g
g/RT_CK_EXTERNAL/s//BU_CK_EXTERNAL/g
g/rt_dist_pt3_lseg3/s//bn_dist_pt3_lseg3/g
g/rt_3pts_collinear/s//bn_3pts_collinear/g
g/rt_pt3_pt3_equal/s//bn_pt3_pt3_equal/g
g/rt_dist_pt2_lseg2/s//bn_dist_pt2_lseg2/g
g/rt_isect_lseg3_lseg3/s//bn_isect_lseg3_lseg3/g
g/rt_isect_line3_line3/s//bn_isect_line3_line3/g
g/rt_2line3_colinear/s//bn_2line3_colinear/g
g/rt_isect_pt2_lseg2/s//bn_isect_pt2_lseg2/g
g/rt_isect_line2_lseg2/s//bn_isect_line2_lseg2/g
g/rt_isect_lseg2_lseg2/s//bn_isect_lseg2_lseg2/g
g/rt_isect_line2_line2/s//bn_isect_line2_line2/g
g/rt_dist_line_point/s//bn_dist_line3_pt3/g
g/rt_dist_pt3_pt3/s//bn_dist_pt3_pt3/g
g/rt_3pts_distinct/s//bn_3pts_distinct/g
g/rt_mk_plane_3pts/s//bn_mk_plane_3pts/g
g/rt_mkpoint_3planes/s//bn_mkpoint_3planes/g
g/rt_isect_line3_plane/s//bn_isect_line3_plane/g
g/rt_isect_2planes/s//bn_isect_2planes/g
g/rt_isect_2lines/s//bn_isect_2lines/g
g/rt_isect_line_lseg/s//bn_isect_line_lseg/g
g/rt_dist_line3_pt3/s//bn_dist_line3_pt3/g
g/rt_distsq_line3_pt3/s//bn_distsq_line3_pt3/g
g/rt_dist_line_origin/s//bn_dist_line_origin/g
g/rt_dist_line2_point2/s//bn_dist_line2_point2/g
g/rt_distsq_line2_point2/s//bn_distsq_line2_point2/g
g/rt_area_of_triangle/s//bn_area_of_triangle/g
g/rt_isect_pt_lseg/s//bn_isect_pt_lseg/g
g/rt_dist_pt_lseg/s//bn_dist_pt_lseg/g
g/rt_rotate_bbox/s//bn_rotate_bbox/g
g/rt_rotate_plane/s//bn_rotate_plane/g
g/rt_coplanar/s//bn_coplanar/g
g/rt_angle_measure/s//bn_angle_measure/g
g/rt_dist_pt3_along_line3/s//bn_dist_pt3_along_line3/g
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g/rt_dist_pt2_along_line2/s//bn_dist_pt2_along_line2/g
g/rt_between/s//bn_between/g
g/rt_printb/s//bu_printb/g
g/NMG_CK_PTBL/s//BU_CK_PTBL/g
g/NMG_TBL_BASEADDR/s//BU_PTBL_BASEADDR/g
g/NMG_TBL_LASTADDR/s//BU_PTBL_LASTADDR/g
g/NMG_TBL_END/s//BU_PTBL_END/g
g/NMG_TBL_GET/s//BU_PTBL_GET/g
g/RT_RAND_TABSIZE/s//BN_RAND_TABSIZE/g
g/RT_RANDSEED/s//BN_RANDSEED/g
g/RT_RANDOM/s//BN_RANDOM/g
g/rt_rand_table/s//bn_rand_table/g
g/rt_tol/s//bn_tol/g
g/RES_ACQUIRE(/s//bu_semaphore_acquire(/
g/RES_RELEASE(/s//bu_semaphore_release(/
g/&rt_g.res_syscall/s//BU_SEM_SYSCALL/
g/&rt_g.res_worker/s//RT_SEM_WORKER/
g/&rt_g.res_stats/s//RT_SEM_STATS/
g/&rt_g.res_results/s//RT_SEM_RESULTS/
g/&rt_g.res_model/s//RT_SEM_MODEL/
g/RES_INIT(/s/RES_INIT.*;/bu_semaphore_init( RT_SEM_LAST );/p
g/RT_VLS_CHECK/s//BU_CK_VLS/g
g/RT_VLS_ADDR/s//bu_vls_addr/g
g/RT_VLS_INIT/s//bu_vls_init/g
g/rt_vls_init/s//bu_vls_init/g
g/rt_vls_vlsinit/s//bu_vls_vlsinit/g
g/rt_vls_addr/s//bu_vls_addr/g
g/rt_vls_strdup/s//bu_vls_strdup/g
g/rt_vls_strgrab/s//bu_vls_strgrab/g
g/rt_vls_extend/s//bu_vls_extend/g
g/rt_vls_setlen/s//bu_vls_setlen/g
g/rt_vls_strlen/s//bu_vls_strlen/g
g/rt_vls_trunc/s//bu_vls_trunc/g
g/rt_vls_trunc2/s//bu_vls_trunc2/g
g/rt_vls_nibble/s//bu_vls_nibble/g
g/rt_vls_free/s//bu_vls_free/g
g/rt_vls_vlsfree/s//bu_vls_vlsfree/g
g/rt_vls_strcpy/s//bu_vls_strcpy/g
g/rt_vls_strncpy/s//bu_vls_strncpy/g
g/rt_vls_strcat/s//bu_vls_strcat/g
g/rt_vls_strncat/s//bu_vls_strncat/g
g/rt_vls_vlscat/s//bu_vls_vlscat/g
g/rt_vls_vlscatzap/s//bu_vls_vlscatzap/g
g/rt_vls_from_argv/s//bu_vls_from_argv/g
g/rt_vls_fwrite/s//bu_vls_fwrite/g
g/rt_vls_gets/s//bu_vls_gets/g
g/rt_vls_putc/s//bu_vls_putc/g
g/rt_vls_printf/s//bu_vls_printf/g
g/CxCopy/s//bn_cx_copy/g
g/CxNeg/s//bn_cx_neg/g
g/CxReal/s//bn_cx_real/g
g/CxImag/s//bn_cx_imag/g
g/CxAdd/s//bn_cx_add/g
g/CxAmplSq/s//bn_cx_amplsq/g
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g/CxAmpl/s//bn_cx_ampl/g
g/CxConj/s//bn_cx_conj/g
g/CxCons/s//bn_cx_cons/g
g/CxPhas/s//bn_cx_phas/g
g/CxScal/s//bn_cx_scal/g
g/CxSub/s//bn_cx_sub/g
g/CxMul/s//bn_cx_mul/g
g/CxMul2/s//bn_cx_mul2/g
g/CxDiv/s//bn_cx_div/g
g/rt_poly_scale/s//bn_poly_scale/g
g/rt_pr_poly/s//bn_pr_poly/g
g/rt_pr_roots/s//bn_pr_roots/g
g/TBL_INIT/s//BU_PTBL_INIT/g
g/TBL_INS/s//BU_PTBL_INS/g
g/TBL_LOC/s//BU_PTBL_LOC/g
g/TBL_FREE/s//BU_PTBL_FREE/g
g/TBL_RST/s//BU_PTBL_RST/g
g/TBL_CAT/s//BU_PTBL_CAT/g
g/TBL_RM/s//BU_PTBL_RM/g
g/TBL_INS_UNIQUE/s//BU_PTBL_INS_UNIQUE/g
g/TBL_ZERO/s//BU_PTBL_ZERO/g
g/rt_pi/s//bn_pi/g
g/matXvec/s//bn_matXvec/g
g/mat_ae/s//bn_mat_ae/g
g/mat_ae_vec/s//bn_ae_vec/g
g/mat_aet_vec/s//bn_aet_vec/g
g/mat_angles/s//bn_mat_angles/g
g/mat_arb_rot/s//bn_mat_arb_rot/g
g/mat_atan2/s//bn_atan2/g
g/mat_copy/s//bn_mat_copy/g
g/mat_degtorad/s//bn_degtorad/g
g/mat_dup/s//bn_mat_dup/g
g/mat_eigen2x2/s//bn_eigen2x2/g
g/mat_fromto/s//bn_mat_fromto/g
g/mat_htov_move/s//bn_htov_move/g
g/mat_identity/s//bn_mat_identity/g
g/mat_idn/s//MAT_IDN/g
g/mat_inv/s//bn_mat_inv/g
g/rt_mat_is_equal/s//bn_mat_is_equal/g
g/mat_is_identity/s//bn_mat_is_identity/g
g/mat_lookat/s//bn_mat_lookat/g
g/mat_mul/s//bn_mat_mul/g
g/mat_mul2/s//bn_mat_mul2/g
g/mat_print/s//bn_mat_print/g
g/mat_radtodeg/s//bn_radtodeg/g
g/mat_scale_about_pt/s//bn_mat_scale_about_pt/g
g/mat_trn/s//bn_mat_trn/g
g/mat_vec_ortho/s//bn_vec_ortho/g
g/mat_vec_perp/s//bn_vec_perp/g
g/mat_vtoh_move/s//bn_vtoh_move/g
g/mat_xform_about_pt/s//bn_mat_xform_about_pt/g
g/mat_xrot/s//bn_mat_xrot/g
g/mat_yrot/s//bn_mat_yrot/g
g/mat_zrot/s//bn_mat_zrot/g
```

```
g/mat_zero/s//bn_mat_zero/g
g/rb_tree/s//bu_rb_tree/g
g/RB_TREE_NULL/s//BU_RB_TREE_NULL/g
g/rb_min/s//bu_rb_min/g
g/rb_max/s//bu_rb_max/g
g/rb_pred/s//bu_rb_pred/g
g/rb_succ/s//bu_rb_succ/g
g/rb_create/s//bu_rb_create/g
g/rb_create1/s//bu_rb_create1/g
g/rb_delete/s//bu_rb_delete/g
g/rb_diagnose_tree/s//bu_rb_diagnose_tree/g
g/rb_extreme/s//bu_rb_extreme/g
g/rb_insert/s//bu_rb_insert/g
g/rb_neighbor/s//bu_rb_neighbor/g
g/rb_search/s//bu_rb_search/g
g/rb_search1/s//bu_rb_search1/g
g/rb_summarize_tree/s//bu_rb_summarize_tree/g
g/rb_walk/s//bu_rb_walk/g
g/rb_walk1/s//bu_rb_walk1/g
g/RT_VLIST_CHUNK/s//BN_VLIST_CHUNK/g
g/rt_vlist/s//bn_vlist/g
g/RT_VLIST_NULL/s//BN_VLIST_NULL/g
g/RT_VLIST_MAGIC/s//BN_VLIST_MAGIC/g
g/RT_CK_VLIST/s//BN_CK_VLIST/g
g/RT_VLIST_LINE_MOVE/s//BN_VLIST_LINE_MOVE/g
g/RT_VLIST_LINE_DRAW/s//BN_VLIST_LINE_DRAW/g
g/RT_VLIST_POLY_START/s//BN_VLIST_POLY_START/g
g/RT_VLIST_POLY_MOVE/s//BN_VLIST_POLY_MOVE/g
g/RT_VLIST_POLY_DRAW/s//BN_VLIST_POLY_DRAW/g
g/RT_VLIST_POLY_END/s//BN_VLIST_POLY_END/g
g/RT_VLIST_POLY_VERTNORM/s//BN_VLIST_POLY_VERTNORM/g
g/rt_vlblock/s//bn_vlblock/g
g/RT_VLBLOCK_MAGIC/s//BN_VLBLOCK_MAGIC/g
g/RT_CK_VLBLOCK/s//BN_CK_VLBLOCK/g
g/BU_BU_/s//BU_/g
g/bu_bu_/s//bu_/g
g/bn_bn_/s//bn_/g
g/bn_pipe/s//rt_pipe/g
     major API overhaul [6.0]
7.14
----
s/rt_db_free_internal\(([^,]+),[^\)]*\)/rt_db_free_internal(\1)/g
     struct resource pointer parameter removed [7.14]

7.16
----
s/rt_ptalloc\(\);/(struct rt_pt_node *)bu_malloc(sizeof(struct
rt_pt_node), "rt_pt_node");/g
     rt_ptalloc() removed [7.16]

7.18
----
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_INIT([^\)]*)\)/bu_ptbl_init(\1,
64, "init")/g
```

```
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_RST([^\)]*)\)/bu_ptbl_reset(\1)/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_INS([^\)]*)\)/bu_ptbl_ins(\1\2)/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_LOC([^\)]*)\)/bu_ptbl_locate(\1\2)
/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_ZERO([^\)]*)\)/bu_ptbl_zero(\1\2/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_INS_UNIQUE([^\)]*)\)/bu_ptbl_ins_u
nique(\1\2)/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_RM([^\)]*)\)/bu_ptbl_rm(\1\2)/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_CAT([^\)]*)\)/bu_ptbl_cat(\1\2)/g
s/bu_ptbl\(([^,]*),[[:space:]]*BU_PTBL_FREE([^\)]*)\)/bu_ptbl_free(\1)/g
       bu_ptbl() removed [7.18]

s/nmg_struct_counts\(/nmg_pr_m_struct_counts(/g
        nmg_struct_counts() renamed to nmg_pr_m_struct_counts() [7.18]

s/bu_vlb_getBuffer\(/bu_vlb_addr(/g
        bu_vlb_getBuffer() renamed to bu_vlb_addr() [7.18]

s/bu_vlb_getBufferLength\(/bu_vlb_buflen(/g
        bu_vlb_getBufferLength() renamed to bu_vlb_buflen() [7.18]

s/V2APPROXEQUAL\(/V2NEAR_EQUAL(/g
        V2APPROXEQUAL() renamed to V2NEAR_EQUAL() [7.18]

s/VAPPROXEQUAL\(/VNEAR_EQUAL(/g
        VAPPROXEQUAL() renamed to VNEAR_EQUAL() [7.18]

s/db_get_version\(/db_version(/g
        db_get_version() renamed to db_version() [7.18]

s/db_get_directory_size\(/db_directory_size(/g
        db_get_directory_size() renamed to db_directory_size() [7.18]

s/db_get_directory\(/db_alloc_directory_block(/g
        db_get_directory() renamed to db_alloc_directory_block() [7.18]

s/rt_get_seg\(/rt_alloc_sed_block(/g
        rt_get_seg() renamed to rt_alloc_seg_block() [7.18]

s/db_shader_mat\(/rt_shader_mat(/g
        db_shader_mat() renamed to rt_shader_mat() [7.18]

s/SMALL([^_])/SMALL_FAST\1/g
        SMALL renamed to SMALL_FASTF [7.18]

7.20
----
s/spm_([^\)]*)/bn_spm_\1/g
        spm functions and types renamed to bn_spm [7.20]

s/RT_CK_SPM/BN_CK_SPM_MAP/g
        RT_CK_SPM macro renamed to BN_CK_SPM MAP [7.20]

s/SPM_MAGIC/BN_SPM_MAGIC/g
```

```
        SPM_MAGIC renamed to BN_SPM_MAGIC [7.20]


s/SPM_NULL/BN_SPM_MAP_NULL/g
        SPM_NULL renamed to BN_SPM_MAP_NULL [7.20]


s/BU_EXTERN[[:space:]]*\([[:space:]]*([^,]*?)[[:space:]]*,[[:space:]]*\([[
:space:]]*([^)]*)[[:space:]]*\)[[:space:]]*\)/extern \1(\2)/g
        BU_EXTERN() no longer necessary due to C89 minimum, use extern
[7.20]


s/[[:space:]]*BU_ARGS[[:space:]]*\([[:space:]]*([^)]*[[:space:]]*)[[:spac
e:]]*\)/\1/g
        BU_ARGS() no longer necessary due to C89 minimum, list args [7.20]


s/BU_LIST_UNINITIALIZED/!BU_LIST_IS_INITIALIZED/g
        BU_LIST_IS_INITIALIZED() removed for consistency [7.20]


s/BU_INIT_EXTERNAL/BU_EXTERNAL_INIT/g
        renamed for API consistency [7.20]


s/RT_CK_DBTR/RT_CK_DB_TRAVERSE/g
s/RT_DBTR_MAGIC/RT_DB_TRAVERSE_MAGIC/g
        renamed for API consistency [7.20]


s/RT_INIT_([A-Z_]*)/RT_\1_INIT/g
        renamed all RT_INIT_[type] macros to RT_[type]_INIT for API
consistency [7.20]


s/BU_LIST_MAGIC_OK/BU_LIST_MAGIC_EQUAL/g
s/BU_LIST_MAGIC_WRONG/!BU_LIST_MAGIC_EQUAL/g
        renamed and consolidated to be consistent with libbn [7.20]


s/nmg_moveeu/nmg_je/g
        function has been renamed


7.22
----


s/rt_dist_pt3_line3/bn_dist_pt3_line3/g
s/rt_dist_line3_line3/bn_dist_line3_line3/g
s/rt_dist_line3_lseg3/bn_dist_line3_lseg3/g
        functions moved from librt to libbn [7.21]
s/bu_tcl_setup/Bu_Init/g
        removed bu_tcl_setup() in favor of Bu_Init() [7.21]
s/bu_tcl_([^(]*)\([^,]*?[[:space:]]*,[^,]*?[[:space:]]*,(.*)/bu_\1(\2/g
        removed all bu_tcl_*() functions, leaving off interp and using
native bu function [7.21]
s/bu_badmagic_tcl\([^,]*?[[:space:]]*,(.*)/bu_badmagic(\1/g
        removed bu_badmagic_tcl() in favor of bu_badmagic() [7.21]
s/(.*)_CK(.*)_TCL\([^,]*?[[:space:]]*,(.*)/\1_CK\2(\3/g
        removed all *_CK*_TCL() macros (e.g., BU_CKMAG_TCL, RT_CK_DBI_TCL,
etc.) in favor of non-TCL macros [7.21]
s/bu_image/icv_image/g
        moved bu_image* functions to libicv as icv_image* [7.21]
```

```
s/BU_IMAGE/ICV_IMAGE/g
     moved BU_IMAGE* macros to icv.h as ICV_IMAGE* [7.21]
s/bu_cmd\(([^,]*?),[[:space:]]*([^,]*?),[[:space:]]*([^,]*?),[[:space:]]*
([^,)]*?),[[:space:]]*([^)]*?)\)/bu_cmd(\4, \2, \3, \5, \1, NULL)/g
     inputs then outputs.  swapped bu_cmd's 4th parameter to 1st, 1st to
5th, and added a new return value hook last. [7.21]
s/V3(.*)_TOL\(([^,]*,)([^,]*,)([^,]*,)([^)]*)\)/V3\1_TOL(\1\2\3(\4)-
>dist)/g
     V3RPP_OVERLAP_TOL(), V3PT_IN_RPP_TOL(), and V3PT_OUT_RPP_TOL() tol
parameter changed to value [7.21]
s/BU_GETSTRUCT\([[:space:]]*([^,)]+,)[[:space:]]*([^)]+)[[:space:]]*\)/BU
_GET(\1 struct \2)/g
     BU_GETSTRUCT(ptr, struct_type) changed to BU_GET(ptr, struct
struct_t) [7.21]
s/BU_GETUNION\([[:space:]]*([^,)]+,)[[:space:]]*([^)]+)[[:space:]]*\)/BU_
GET(\1 union \2)/g
s/BU_GETTYPE\([[:space:]]*([^,)]+,)[[:space:]]*([^)]+)[[:space:]]*\)/BU_G
ET(\1 \2)/g
     BU_GETUNION() and BU_GETTYPE() macros changed to BU_GET() [7.21]
s/CMD_NULL/BU_CMD_NULL/g
s/CMDHIST/BU_CMDHIST/g
     prefix the cmd.h defines with BU_ since they are part of libbu
[7.21]
s/bu_shader_to_tcl_list/bu_shader_to_list/g
     renamed as it applies to any list in {} form, tcl or otherwise
[7.21]
s/bu_(add|delete|call)_hook/bu_hook_\1/g
     renamed hook functions to be consistent with other libbu API [7.21]
s/bu_file_exists\(([^)]*)\)/bu_file_exists(\1, NULL)/g
     new file descriptor parameter added [7.21]
s/bu_list_path\(([^,]*),([^,]*),[[:space:]]([^)]*)\)/bu_dir_list(\1,\2,
&(\3))/g
s/bu_count_path(.*)\);/bu_dir_list\1, NULL);/g
     made bu_dir_list() return the number of entries [7.21]
s/bu_strcmpm\((.*),([^,]*)\)/bu_strcmp(\1)/g
     no use for label parameter, convert to bu_strcmp() [7.21]
     bu_set_realtime() [deprecated 7.22]


7.24
----
s/bu_set_realtime\([[:space:]]\);//g
     didn't do anything [7.23]
s/.*bu_cpulimit_[sg]et\([[:space:]]\);//g
     didn't do anything [7.23]
s/rt_g\./RTG./g
     renamed rt_g global to RTG so it doesn't match the struct name
[7.24]
s/rt_functab\[/OBJ\[/g
     renamed rt_functab global to OBJ so it doesn't match the struct
name [7.24]
s/redraw_vlist/draw/g
     removed redraw_vlist mged command, just call draw or refresh [7.24]
s/RT_BADNUM/INVALID/g
s/RT_BADVAL/VINVALID/g
```

moved RT_BADNUM and RT_BADVEC to vmath.h as INVALID and VINVALID
[7.24]
s/bu_create_hash_tbl/bu_hash_tbl_create/g
s/bu_find_hash_entry/bu_hash_tbl_find/g
s/bu_hash_add_entry/bu_hash_tbl_add/g
s/bu_hash_tbl_pr/bu_hash_tbl_print/g
      renamed for better consistency in hash table API and with other
libbu API [7.24]
s/dm_applicationfocus\(([[:space:]]*\);//g
      only useful in older os x versions, users can now do the same thing
via XQuartz preferences [7.24]
s/bu_vls_trunc2/bu_vls_trunc/g
      removed duplicitous function in favor of more general version
[7.24]
s/bn_pi/M_PI/g
s/bn_twopi/M_2PI/g
s/bn_halfpi/M_PI_2/g
s/bn_quarterpi/M_PI_4/g
s/bn_invpi/M_1_PI/g
s/bn_inv2pi/M_1_2PI/g
s/bn_inv4pi/M_1_4PI)/g
s/bn_inv255/(1.0 \/ 255.0)/g
s/bn_degtorad/DEG2RAD/g
s/bn_radtodeg/RAD2DEG/g
s/bn_sin_scale/(BN_SINTABSIZE \/ M_2PI)/g
      eliminated a number of libbn globals in favor of existing constants
[7.24]
s/(#[[:space:]]*include[[:space:]]+["<])vfont-if\.h/\1bu\/vfont.h/g
s/(#[[:space:]]*include[[:space:]]+["<])cmd\.h/\1bu\/cmd.h/g
s/(#[[:space:]]*include[[:space:]]+["<])hist\.h/\1bu\/hist.h/g
s/(#[[:space:]]*include[[:space:]]+["<])magic\.h/\1bu\/magic.h/g
      library-specific public headers moved into a subdir [7.24]
s/([^_])([nh]to[hn][fd])/\1bu_cv_\2/g
      ntohf, ntohd, htonf, htond renamed with bu_cv_ prefix [7.24]

7.26
----
s/bu_kill_parallel\(([[:space:]]*\);//g
      didn't do anything unless called from forked process, use
bu_terminate() [7.25]
s/bu_jmpbuf/bu_jmpbuf[0]/g
s/bu_setjmp_valid/bu_setjmp_valid[0]/g
      can replace 0 with bu_parallel_id() to get thread-safe jumping
[7.25]
s/bu_semaphore_reinit/bu_semaphore_init/g
      no longer need to manually reinitialize (or initialize) semaphores
[7.25]
s/(#[[:space:]]*include[[:space:]]+["<])fbio\.h/\1bu\/fb.h/g
      fbio.h is now part of fb.h [7.25]
s/UNION/'u'/g
s/SUBTRACT/'-'/g
s/INTERSECT/'+'/g
      old db.h db4 preprocessor symbols removed, use char or DB_OP_*
[7.25]

```
s/(#[[:space:]]*include[[:space:]]+["<])bselect\.h/\1bsocket.h/g
s/(#[[:space:]]*include[[:space:]]+["<])bin\.h/\1bnetwork.h/g
      rename bselect.h and bin.h public headers to be more declaratively
named [7.25]
s/db5_enc_len\[(.*)\]/DB5_ENC_LEN(\1)/g
      replaced db5_enc_len[] global array with DB5_ENC_LEN() macro [7.25]
s/db_normalize/bu_normalize/g
      move the path normalization routine to libbu [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])bot\.h/\1rt\/primitives\/bot.h/g
      consolidate bot header contents [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])anim\.h/\1bn\/anim.h/g
      consolidate anim header contents [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])plot3\.h/\1bn.h/g
      plot3 implementation is in libbn, move header and replace plot3.h
with bn.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])vectfont\.h/#define LAST -
128\n\1bn\/vectfont.h/g
      consolidate vectfont.h files [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])spm\.h/\1bn\/spm.h/g
      move spm.h into bn subheader directory [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])dvec\.h/\1bn\/dvec.h/g
s/(#[[:space:]]*include[[:space:]]+["<])vector_fpu\.h/\1bn\/vector_fpu.h/
g
s/(#[[:space:]]*include[[:space:]]+["<])vector_x86\.h/\1bn\/vector_x86.h/
g
      move dvec.h and friends into bn subheader directory [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])db\.h/\1rt\/db4.h/g
      move db.h to rt/db4.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])db5\.h/\1rt\/db5.h/g
      move db5.h to rt/db5.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])mater\.h/\1raytrace.h/g
      merge mater.h with rt/mater.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])nurb\.h/#include
"raytrace.h"\n\1rt\/nurb.h/g
      move nurb.h to rt/nurb.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])rtfunc\.h/#include
"raytrace.h"\n\1rt\/func.h/g
      move rtfunc.h to rt/func.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])tol\.h/#include "bn.h"\n#include
"raytrace.h"\n\1rt\/tol.h/g
      consolidate tol.h and rt/tol.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])tie\.h/\1rt\/tie.h/g
      move tie.h to rt/tie.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])solid\.h/#include
"raytrace.h"\n\1rt\/solid.h/g
      move solid.h to rt/solid.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])shadework\.h/\1optical\/shadework
.h/g
      move shadework.h to optical/shadework.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])shadefuncs\.h/\1optical.h/g
      move shadefuncs.h to optical/shadefuncs.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])light\.h/#include
"bn.h"\n#include "raytrace.h"\n\1optical\/light.h/g
      move light.h to optical/light.h [7.25]
```

```
s/(#[[:space:]]*include[[:space:]]+["<])plastic\.h/\1optical\/plastic.h/g
      move plastic.h to optical/plastic.h [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])rtgeom\.h/\1rt\/geom.h/g
      move rtgeom.h to rt/geom.h [7.25]
s/rt_vlist_get_cmd_description/bn_vlist_get_cmd_description/g
s/rt_ck_vlist/bn_ck_vlist/g
s/rt_vlist_export/bn_vlist_export/g
s/rt_vlblock_free/bn_vlblock_free/g
s/rt_vlblock_find/bn_vlblock_find/g
      move vlist functions from librt to libbn [7.25]
s/([[:space:],\(,"])bn_tcl/\1tclcad_bn/g
s/([[:space:],\(,"])rt_tcl_rt/\1tclcad_rt/g
s/([[:space:],\(,"])rt_tcl/\1tclcad_rt/g
      tcl library registrations moved to libtclcad [7.25]
s/rt_grow_boolstack/rt_bool_growstack/g
      rename with consistent prefixes [7.25]
s/(#[[:space:]]*include[[:space:]]+["<])obj\.h/\1dm\/bview.h/g
s/GED_VIEW_OBJ_NULL/VIEW_OBJ_NULL/g
      move view_obj to dm/bview.h [7.25]
s/BU_PTBL_CLEAR_I\((.*)\)/BU_PTBL_SET(\1, (long*)0)/g
      replace BU_PTBL_CLEAR_I into the BU_PTBL_SET command [7.25]
s/BU_PTBL_END\(([^\)]*)\)/(\1)->end/g
        replace BU_PTBL_END with direct ptbl peek or BU_PTBL_LEN [7.25]
s/bu_free_argv/bu_argv_free/g
s/bu_dup_argv/bu_argv_dup/g
s/bu_dupinsert_argv/bu_argv_dupinsert/g
      bu_*_argv -> bu_argv_* [7.25]
s/bu_dir_list/bu_file_list/g
      bu_dir_list -> bu_file_list [7.25]
s/BU_FNMATCH_NOMATCH/1/g
      don't use an explicit define for the non-matching case [7.25]
s/bu_basename\(([^\)]*)\)/bu_basename(\1, NULL)/g
      pass NULL argument to get a dynamically allocated buffer back
[7.25]


7.28
----
s/bu_free_array/bu_free_args/g
        fixed misleading name [7.26]
s/(#[[:space:]]*include[[:space:]]+["<])bu\/rb\.h/\1bu\/redblack.h/g
      clearer header name [7.26]
s/rt_plot_vlblock/bn_plot_vlblock/g
s/rt_vlist_to_uplot/bn_vlist_to_uplot/g
        move vlist functions to libbn [7.26]
s/rt_nurb_bezier/nmg_nurb_bezier/g
s/rt_nurb_c_split/nmg_nurb_c_split/g
s/rt_nurb_free_cnurb/nmg_nurb_free_cnurb/g
s/rt_nurb_free_snurb/nmg_nurb_free_snurb/g
s/rt_nurb_intersect/nmg_nurb_intersect/g
s/rt_nurb_new_cnurb/nmg_nurb_new_cnurb/g
s/rt_nurb_new_snurb/nmg_nurb_new_snurb/g
s/rt_nurb_s_eval/nmg_nurb_s_eval/g
s/rt_nurb_s_norm/nmg_nurb_s_norm/g
s/rt_nurb_uv_hit/nmg_nurb_uv_hit/g
```

```
s/rt_arc2d_to_cnurb/nmg_arc2d_to_cnurb/g
s/rt_join_cnurbs/nmg_join_cnurbs/g
s/rt_nurb_c_eval/nmg_nurb_c_eval/g
s/rt_nurb_c_print/nmg_nurb_c_print/g
s/rt_nurb_kvgen/nmg_nurb_kvgen/g
s/rt_nurb_kvmerge/nmg_nurb_kvmerge/g
s/rt_nurb_s_print/nmg_nurb_s_print/g
s/rt_nurb_s_refine/nmg_nurb_s_refine/g
s/rt_bez_check/nmg_bez_check/g
s/rt_nurb_back_solve/nmg_nurb_back_solve/g
s/rt_nurb_basis_eval/nmg_nurb_basis_eval/g
s/rt_nurb_c_bound/nmg_nurb_c_bound/g
s/rt_nurb_c_check/nmg_nurb_c_check/g
s/rt_nurb_c_diff/nmg_nurb_c_diff/g
s/rt_nurb_c_refine/nmg_nurb_c_refine/g
s/rt_nurb_c_xsplit/nmg_nurb_c_xsplit/g
s/rt_nurb_calc_oslo/nmg_nurb_calc_oslo/g
s/rt_nurb_cinterp/nmg_nurb_cinterp/g
s/rt_nurb_clean_cnurb/nmg_nurb_clean_cnurb/g
s/rt_nurb_clip_srf/nmg_nurb_clip_srf/g
s/rt_nurb_crv_copy/nmg_nurb_crv_copy/g
s/rt_nurb_crv_flat/nmg_nurb_crv_flat/g
s/rt_nurb_curvature/nmg_nurb_curvature/g
s/rt_nurb_doolittle/nmg_nurb_doolittle/g
s/rt_nurb_eval_crv/nmg_nurb_eval_crv/g
s/rt_nurb_forw_solve/nmg_nurb_forw_solve/g
s/rt_nurb_free_oslo/nmg_nurb_free_oslo/g
s/rt_nurb_gen_knot_vector/nmg_nurb_gen_knot_vector/g
s/rt_nurb_knot_index/nmg_nurb_knot_index/g
s/rt_nurb_kvcheck/nmg_nurb_kvcheck/g
s/rt_nurb_kvcopy/nmg_nurb_kvcopy/g
s/rt_nurb_kvextract/nmg_nurb_kvextract/g
s/rt_nurb_kvknot/nmg_nurb_kvknot/g
s/rt_nurb_kvmult/nmg_nurb_kvmult/g
s/rt_nurb_kvnorm/nmg_nurb_kvnorm/g
s/rt_nurb_map_oslo/nmg_nurb_map_oslo/g
s/rt_nurb_mesh_diff/nmg_nurb_mesh_diff/g
s/rt_nurb_mk_poly/nmg_nurb_mk_poly/g
s/rt_nurb_p_mat/nmg_nurb_p_mat/g
s/rt_nurb_plot_cnurb/nmg_nurb_plot_cnurb/g
s/rt_nurb_plot_snurb/nmg_nurb_plot_snurb/g
s/rt_nurb_poly/nmg_nurb_poly/g
s/rt_nurb_pr_crv/nmg_nurb_pr_crv/g
s/rt_nurb_pr_kv/nmg_nurb_pr_kv/g
s/rt_nurb_pr_mesh/nmg_nurb_pr_mesh/g
s/rt_nurb_pr_oslo/nmg_nurb_pr_oslo/g
s/rt_nurb_print_pt_type/nmg_nurb_print_pt_type/g
s/rt_nurb_project_srf/nmg_nurb_project_srf/g
s/rt_nurb_region_from_srf/nmg_nurb_region_from_srf/g
s/rt_nurb_s_bound/nmg_nurb_s_bound/g
s/rt_nurb_s_check/nmg_nurb_s_check/g
s/rt_nurb_s_diff/nmg_nurb_s_diff/g
s/rt_nurb_s_flat/nmg_nurb_s_flat/g
s/rt_nurb_s_plot/nmg_nurb_s_plot/g
```

```
s/rt_nurb_s_split/nmg_nurb_s_split/g
s/rt_nurb_s_xsplit/nmg_nurb_s_xsplit/g
s/rt_nurb_scopy/nmg_nurb_scopy/g
s/rt_nurb_sinterp/nmg_nurb_sinterp/g
s/rt_nurb_solve/nmg_nurb_solve/g
s/rt_nurb_to_poly/nmg_nurb_to_poly/g
        rename old nurbs functions intertwined with nmg to use nmg prefix
[7.26]
s/RTG.NMG_debug/nmg_debug/g
     make nmg debug flag top level, like libbu's [7.26]
s/BU_ASSERT(_[A-
Z_]+)\(([^,]+|.*\(.*,.*\)),([^,]+|.*\(.*,.*\)),([^,]+|.*\(.*,.*\))\);/BU_
ASSERT(\2\3\4);/g
      consolidated BU_ASSERT_PTR, BU_ASSERT_LONG, BU_ASSERT_SIZE_T,
BU_ASSERT_SSIZE_T, BU_ASSERT_DOUBLE [7.26]
s/BU_FLSTR/CPP_FILELINE/g
s/vert_root/bn_vert_tree/g
s/create_vert_tree[[:space:]]*\(/bn_vert_tree_create\(/g
s/create_vert_tree_w_norms[[:space:]]*\(/bn_vert_tree_create_w_norms\(/g
s/free_vert_tree[[:space:]]*\(/bn_vert_tree_destroy\(/g
s/Add_vert[[:space:]]*\(([^,]*,)([^,]*,)([^,]*,)([^,]*,)/bn_vert_tree_add
\(\4\1\2\3/g
s/Add_vert_and_norm[[:space:]]*\(([^,]*,)([^,]*,)([^,]*,)([^,]*,)([^,]*,)
([^,]*,)([^,]*,)/bn_vert_tree_add_w_norm\(\7\1\2\3\4\5\6/g
s/clean_vert_tree[[:space:]]*\(/bn_vert_tree_clean\(/g
```