



New Features of the BRL-CAD Database Format

Lee A. Butler



New Database Outline

- Introduction & Upgrading
- Machine Independence
- Attributes
- New ASCII form
- Binary objects
- Hiding
- Unlimited length names
- Neu-Speak terms



Introduction

- New format introduced in Release 6.0
- mged will edit either old or new format
 - Note that new capabilities only work on new version databases
- New format is more compact than previous version
- New capabilities for storing attributes and arbitrary data.



Databases Are Smaller Now

Objects are no longer stored in 128-byte *granules*

| <i>Model</i> | <i>Size (Mbytes)</i> | | □ |
|--------------|----------------------|-----------------|-----|
| | <i>Rel. 5.x</i> | <i>Rel. 6.0</i> | |
| A-10 | 12.5 | 3.8 | .69 |
| CH-47D | 5.8 | 2.8 | .51 |
| LAV 3R | 107.0 | 101.8 | .05 |
| M60A3 | 2.5 | 1.3 | .50 |
| SCUD | 6.5 | 3.1 | .53 |
| T-72 M1 | 4.1 | 2.0 | .51 |



Upgrading

- The *dbupgrade* command creates a new database in the new format from an existing database.
 - Usage: `dbupgrade old.g new.g5`
- ***Users should convert databases as soon as possible.***
 - Old format remains machine-specific
 - Old format does not support new features such as attributes



Machine Independent

- All floating point stored in big-endian IEEE double precision.
 - More accurate geometry
 - Larger geometry possible
 - On-disk units are still in millimeters
- Integers stored as big-endian
 - In 16-, 32-, and 64-bit representations



Attributes

- Associate arbitrary text data with any object
- Some attribute names already reserved/in-use:
 - MUVES_Component
 - Comment
 - Traditional region flags: region_id, los air_code



Simple Uses of Attributes

```
mged> attr set piston3.r comment "is material right?"
mged> attr set piston3.r RoleModel Elvis
mged> attr get piston3.r comment
is material right?
mged> attr get piston3.r
comment {is material right?} RoleModel {Elvis}
mged> attr set piston3.r MUVES_Component engine
mged> attr set ember rgb [glow [attr ember get T]]
mged> db adjust sphere V [attr get sphere posn(5)]
mged>
```



New ASCII Form

- Optimized for processing with Tcl command interpreter
- Note: special “bwish” and “btclsh” versions of interpreters
 - Contain BRL-CAD extensions to the interpreter



Binary Objects

- Store arbitrary information in a database object.
 - Textures
 - Dsp data for “height fields”
 - User data
 - Pro/E database
 - Reports



Hidden Objects

- The mged “hide” command will remove object from “ls” displays
 - note: ls -a shows ALL objects, even hidden ones
- The mged “unhide” command will make object visible again



New Database Object

- Called `_GLOBAL`
- Stores database global information such as units, tolerances, title, etc.
- Ordinarily “hidden”
- Auto-recreated if it is ever deleted
 - Of course, old values are lost



Neu-Speak

- Some changes in terminology:
 - “Primitive Shape” not “Solid”
 - Originally, BRLCAD supported only platonic solids
 - “Assembly Combination” not “Group”
 - No database object called group.
 - A special “comb” command that inserted “u” operators for you



Thank you

Lee A. Butler

butler@arl.army.mil

410 278 9200