

Title: CREATIVE PDB'S (PARTS DATABASES)

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CREATIVE PDB'S (PARTS DATABASES)

T. J. Cote, Los Alamos National Laboratory

Abstract

PDB component property entries and creative "picklists" can make the schematic entry process and downstream tools such as BOM generation more useful. This presentation will show how creative PDB's can enhance the design process. Examples of PDB entries developed at Los Alamos National Laboratory will be discussed.



"CREATIVE" PDB'S

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TOPICS

→ Introduction / Background Information

- Customizing PDB Properties/Picklists
- PDB Examples
- Displaying PDB Component Properties on Symbols/Schematics
- Editing Property Files
- Displaying PDB Component Properties on BOM's
- Summary



Introduction/Background Information

- Legacy Product - Cadnetix/Dazix
- R&D Environment
- Front to Back Design
- Wide Range of PCB Requirements
- Many Engineering Customers/Clients
- Small Design Section
- No Full-Time Librarian



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CUSTOMIZING PDB PROPERTIES

- Identify Requirements
- Make The PDB Work For You



IDENTIFY REQUIREMENTS

- Identify the requirements of your design process & develop a PDB format that supports it.

For example, we decided that our design process would include using symbol device place on all of our schematics. We found that the default component properties in the delivered pdb's were not adequate for our requirements, so, we modified them.



MAKE THE PDB WORK FOR YOU!

- We set out to make our pdb's "designer friendly" so that our schematic entry tasks would be less cumbersome. We designed a simplified picklist format which we built into our pdb's.



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EXAMPLES

- PDB Component Properties
- PDB "Picklists"

The screenshot shows the Eagle PCB design software interface. The 'Part Numbers' dialog box is open, displaying a list of capacitor types on the left and a table of specific capacitor models and their values on the right. The 'Component Properties' section shows details for the selected capacitor, and the 'Call Selection' section shows the number of pairs set to 2.

Part Name

- CAPACITOR_SM_POLARIZED
- CAPACITOR_THRU
- CAPACITOR_THRU_POLARIZED
- CAPACITOR_VARIABLE

Part Numbers

Default	Manufacturer	Reference Number	
<input type="radio"/>	C	10UF_25V_1_SM	BRM40C010M025BL
<input type="radio"/>	C	10UF_50V_5M	11C1206C0G104000VNT
<input type="radio"/>	C	10UF_50V_1_SM	1206SC10M4AT080
<input type="radio"/>	C	10UF_600V_5M	1625C10M4ET1100
<input type="radio"/>	C	01UF_50V_5M	BRM40C010M0350V
<input type="radio"/>	C	01UF_50V_1_SM	11C1206C0G103000VNT
<input type="radio"/>	C	01UF_50V_2_SM	1206SC10M4AT080
<input type="radio"/>	C	001UF_50V_5M	300R18101022V4Z

Component Properties

Description: CAPACITOR_25V 100K 0.01UF

Symbol: CAPACITOR

Value: 100K

Footprint: CAPACITOR_25V 100K 0.01UF

Call Selection

Number of Pairs: 2

Top Call Name: 100K 50V 500K 0.01UF

Bot Call Name: 100K 50V 500K 0.01UF

The screenshot displays the ESD:Modeler software interface. The 'Part Name' section on the left contains a list of capacitor types: CAPACITOR_SM, CAPACITOR_THRU, CAPACITOR_THRU_POLARIZED, and CAPACITOR_VARIABLE. The 'Part Numbers' section on the right features a table with columns for 'Design', 'Nominal Values', and 'Inventory Numbers'. The table lists various capacitor specifications such as 'C0, 1UF, 10V, SM' and 'C0, 1UF, 20V, SM' along with their corresponding inventory numbers. Below the table are buttons for 'New / Parameters...' and 'Delete'. The 'Component Properties' section at the bottom includes a 'Designator' field with 'CAPACITORSM.TANTALUM C0P', a 'Value' field with '1UF', and a 'Voltage' field with '10V'. The 'Call Selection' section shows a 'Number of Pins' field set to '2' and a 'Description' field with '100 Call Name: C7227 SMD CAPACITOR 50K 7227'. The 'Pin Mapping' section at the bottom has a 'Pin Mapping' button.

Part Name

CAPACITOR_SM
CAPACITOR_THRU
CAPACITOR_THRU_POLARIZED
CAPACITOR_VARIABLE

Part Numbers

Design	Nominal Values	Inventory Numbers
C0, 1UF, 10V, SM	250010940016A27	
C0, 1UF, 20V, SM	250010940020A27	
C0, 1UF, 30V, SM	250010940030B27	
C0, 2.2UF, 30V, SM	195022540030Y28	
C0, 3.3UF, 20V, SM	CS1830940030Y	
C0, 3.3UF, 20V, SM	195032540030Y28	
C0, 4.7UF, 10V, SM	185047540010S28	
C0, 4.7UF, 10V, 2.5M	250047540010S27	

Component Properties

Designator: CAPACITORSM.TANTALUM C0P

Value: 1UF

Voltage: 10V

Call Selection

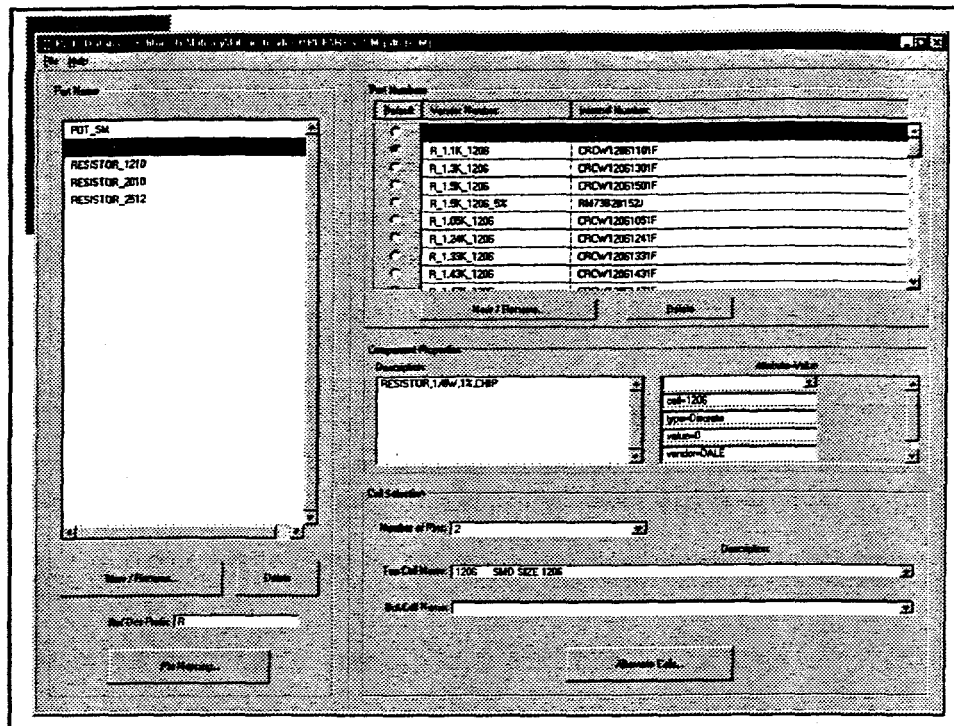
Number of Pins: 2

Description: 100 Call Name: C7227 SMD CAPACITOR 50K 7227

Pin Call Name:

Pin Mapping

Assign Cells...



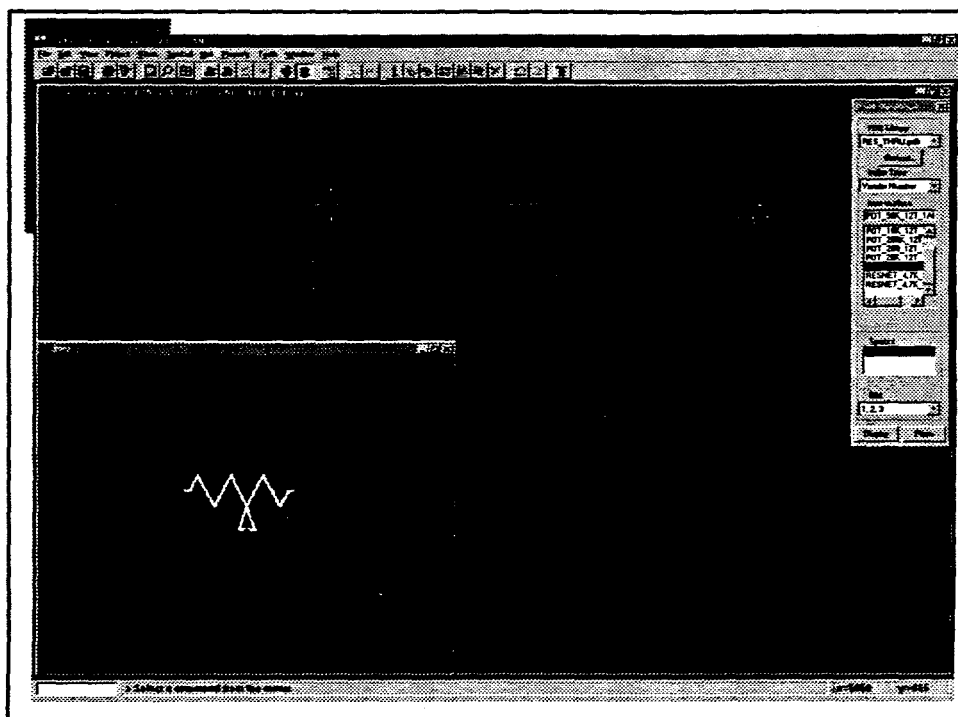
Did You Know....

- You can move pdb entries between pdb libraries in the cell manager?



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PLACING COMPONENT PROPERTIES ON SYMBOLS

- PLACEMENT
- SETTING ROTATIONS
- SETTING VISIBILITY ON/OFF
- COLORIZING PROPERTIES



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EDITING PROPERTY FILES

- PDB EDITOR PROPERTIES *Pdbedit.asc*
- PDB PROPERTY CONFIG. *Pdbprops.asc*
- TEXT PROPERTIES *Vbdc.prp*



Pdbedit.asc

```
SECTION Component
LIST Properties
VALUE "cell="
VALUE "value="
VALUE "vendor="
VALUE "voltage="
VALUE "bottom_height="
VALUE "cost="
VALUE "pins="
VALUE "rating="
VALUE "tech="
VALUE "tolerance="
VALUE "top_height="
.
.
VALUE ""VHDL Model""="
ENDLIST
ENDSECTION
```



Pdbprops.asc

```
!*INCLUDE "Power rating"
!*INCLUDE cost
!*INCLUDE "Frozen package"
!*INCLUDE "State value"
!*INCLUDE "Component tol"
!*INCLUDE CLASS
*INCLUDE value
*INCLUDE cell
*INCLUDE vendor
*INCLUDE voltage
!
```



Vbdc.prp

```
!
*TEXTPROP 1 CELL 16 \a(\a[+]*)*\d(a)+ 1 "Instance name" 0.10in INVISIBLE SINGLE
TEMPLATE Default 6
*TEXTPROP 134 CELL 255 (\a[+])* 1 "F" 0.08in INVISIBLE SINGLE TEMPLATE
Default 6
.
.
.
*TEXTPROP 135 CELL 64.* 1 "cell" 0.12in VISIBLE SINGLE TEMPLATE Default 6 "cell"
*TEXTPROP 136 CELL 64.* 1 "vendor" 0.08in VISIBLE SINGLE TEMPLATE Default 6 "vendor"
*TEXTPROP 137 CELL 64.* 1 "voltage" 0.12in VISIBLE SINGLE TEMPLATE Default 6 "voltage"
```



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Bom.fmt

```
hdr_1 = "-----\n";
hdr_2 = "Los Alamos National Laboratory\n";
hdr_3 = "LANSCE-8 ECAD\n";
hdr_4 = "\n";

sort      = by_internal_partno; /* sort items by internal part number */
lines_per_page = 39;           /* ilp811 laser printer, sb -60 for regular lp's */
col_hdr_just = center;         /* center justify column header text */
col_hdr_bang = -2;             /* column header bang justification */
hdr_just     = center;         /* user defined header justification */
line_size    = 132;           /* number of characters per line */
page_mode    = yes;           /* do page numbers */
print_headers = yes;          /* print page headers */
col_bang     = -2;            /* no column bangs */
print_totals = yes;           /* print qty/cost totals */
continued_line_col = 5;       /* where to print the continued line character */
continued_line_char = "**";    /* character to use for continued lines */

itemno_col = 2;
itemno_len = 4;
itemno_hdr = "ITEM";
```




Bom.fmt

```
qty_col = 8;
qty_len = 5;
qty_hdr = "QTY";

vendor_partno_col = 0;
vendor_partno_len = 0;
vendor_partno_hdr = "PART NUMBER";

internal_partno_col = 81;
internal_partno_len = 18;
internal_partno_hdr = "PART NUMBER";

pins_col = 0; /* don't print pin count */
pins_len = 0;
pins_hdr = "pins";
pins_key = "pins=";

desc_col = 27;
desc_len = 30;
desc_hdr = "DESCRIPTION";
```



Bom.fmt

```
ref_col = 15;
ref_len = 10;
ref_hdr = "REF DES";
ref_format = ocompressed; /* reference designator format */

item_cost_col = 0;
item_cost_len = 0;
item_cost_hdr = "cost";
item_cost_key = "cost=";

total_cost_col = 0;
total_cost_len = 0;
total_cost_hdr = "total";

grand_qty_hdr = "Total Parts Used: ";
grand_cost_hdr = "Total Parts Cost: ";
```



Bom.fmt

```
free1_col = 60;  
free1_len = 8;  
free1_hdr = "VALUE";  
free1_line = 0;  
free1_key = "value=";
```

```
free2_col = 101;  
free2_len = 15;  
free2_hdr = "VENDOR";  
free2_line = 0;  
free2_key = "vendor=";
```

```
free3_col = 71;  
free3_len = 8;  
free3_hdr = "CELL";  
free3_line = 0;  
free3_key = "cell=";
```

```
free4_col = 0;  
free4_len = 0;  
free4_hdr = "free4";  
free4_line = 4;  
free4_key = "free4=";
```



Electronics Design System

Page:

Bill of Materials
<<<from Job: F:\Job\606427\CAE\606427.prj>>>
Los Alamos National Laboratory
LANLCE-8 SCAD

ITEM	REV	DES	DESCRIPTION	VALUE	CELL	PART NUMBER	VENDOR
11	21	D1.D2	DIODE, SCHOTTKY DETECTOR		ACM2	ACM-2035M/P	ADVANCED CONTROL
#1							
21	12	R100,R101	RESISTOR, 1/8W, 1%,CHIP	TBD	1206	CNCW12060000Y	DALE
#1			R102,R103				
#1			R104,R105				
#1			R106,R107				
#1			R108,R109				
#1			R110,R111				
#1							
31	13	R112,R113	RESISTOR, 1/8W, 1%,CHIP	1K	1206	CNCW12061001P	DALE
#1			R114,R115				
#1			R116,R117				
#1			R118,R119				
#1			R120,R121				
#1			R122,R123				
#1			R124				
#1							
41	41	R125,R126	RESISTOR, 1/8W, 1%,CHIP	10K	1206	CNCW12061002P	DALE
#1			R127,R128				
#1							
51	21	R129,R130	RESISTOR, 1/8W, 1%,CHIP	100K	1206	CNCW12061003P	DALE
#1							
61	31	R137,R138	RESISTOR, 1/8W, 1%,CHIP	143	1206	CNCW12061430P	DALE
#1			R139				
#1							
71	11	R142	RESISTOR, 1/8W, 1%,CHIP	287	1206	CNCW12062870P	DALE
#1							
#1							
81	21	R140,R141	RESISTOR, 1/8W, 1%,CHIP	619	1206	CNCW12066190P	DALE
#1							



TOPICS

- Introduction / Background Information
 - Developing Custom PDB Component Properties and Creative Picklists
 - Using PDB Component Properties in Schematics
 - Editing Property Files
 - Extracting PDB Component Properties in BOM's
- Summary



SUMMARY

- "Creative" PDB's can help simplify the design entry process
- Master Library entries need to be created first
- Property files need to be edited for your specific process
- Make the PDB work for You!