



**Master Designer**

**Version 8.5**

**PDIF Reference**

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# About This Manual

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The *PDIF Reference* manual describes the PDIF file and its sections and keywords.

You need to be familiar with basic CAD and CAE concepts to use PDIF. A good understanding of the P-CAD database will also help you in analyzing and editing PDIF files. As a starting point, the *P-CAD Tutorial* provides a good overview of the P-CAD system.

The *PDIF Reference* manual consists of two chapters and six appendixes, as described below.

Chapter 1      “About the PDIF File” describes the structure and format of the PDIF file.

Chapter 2      “Section and Keyword Reference” contains reference information about each section, subsection, and keyword used in the PDIF file.

Appendix A    “Netlist Import” explains how to use PDIF to import a netlist from another CAD system into P-CAD.

Appendix B    “P-CAD to PDIF Cross-Reference” contains a cross-reference of P-CAD commands and status area options to PDIF sections and keywords.

Appendix C    “Example PDIF Files” contains a sample PDIF file for each type of P-CAD database.

A list of conventions follows this section.



# Conventions

---

This manual uses the following conventions:

! or →	Connects commands. Commands following the arrow appear on submenus. For example  File ! Load or File→Load
*	One or more characters can occupy the asterisk's position. Also known as a wildcard.
.	In text, introduces a procedure that explains how to do a task.
Ctrl-F	Press the keys simultaneously.
↵	The return key. Press this key after typing data in a data entry box or on a message line or to accept a default. You can click left in many P-CAD tools instead of pressing ↵.
Enter	Indicates you need to press ↵ after typing data.
Spacebar	The space bar. You can use this key to digitize a point within the drawing area.
<i>italics</i>	Indicates variable characters.
<b>boldface</b>	Indicates characters you enter from the keyboard; for example  Enter <b>sheet7</b> in the data entry box.
<b>boldface</b> <i>italics</i>	Indicates variable characters you enter from the keyboard; for example  Enter <b><i>filename</i></b> in the data entry box.
Click left mouse.	Press and release the left button (button 1) on the

## Conventions

- |              |                                                                                                                                                               |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Click middle | Press and release the middle button (button 2) on the mouse.                                                                                                  |
| Click right  | Press and release the right button (button 3) on the mouse. If you are using a two-button mouse, press <b>Ctrl</b> and button 2 simultaneously to clickright. |
| Cycle        | Click left repeatedly on a cycle box until the item you want is selected. A cycle box is indicated by ◇.                                                      |
| Select       | Move the cursor to an item or point and press ↵, <b>spacebar</b> , or click left.                                                                             |



# About the PDIF File

# 1

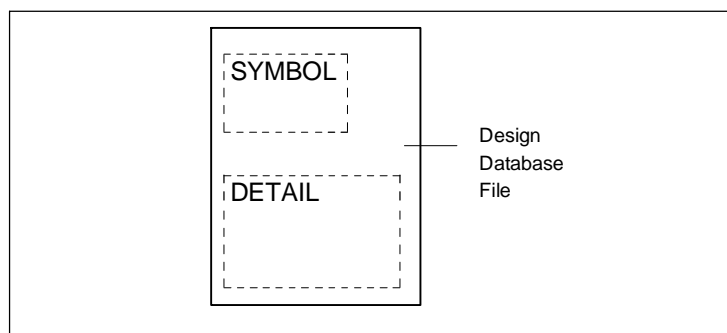
The PDIF file is an ASCII file that you can create, examine, and edit. It can describe a schematic symbol, a PCB part, a schematic, or a PCB design.

This chapter describes the structure and format of the PDIF file and keyword reference and explains each section of the file heading or keyword.

## File Structure

The PDIF file is designed to represent electronic design databases for schematic and PCB applications.

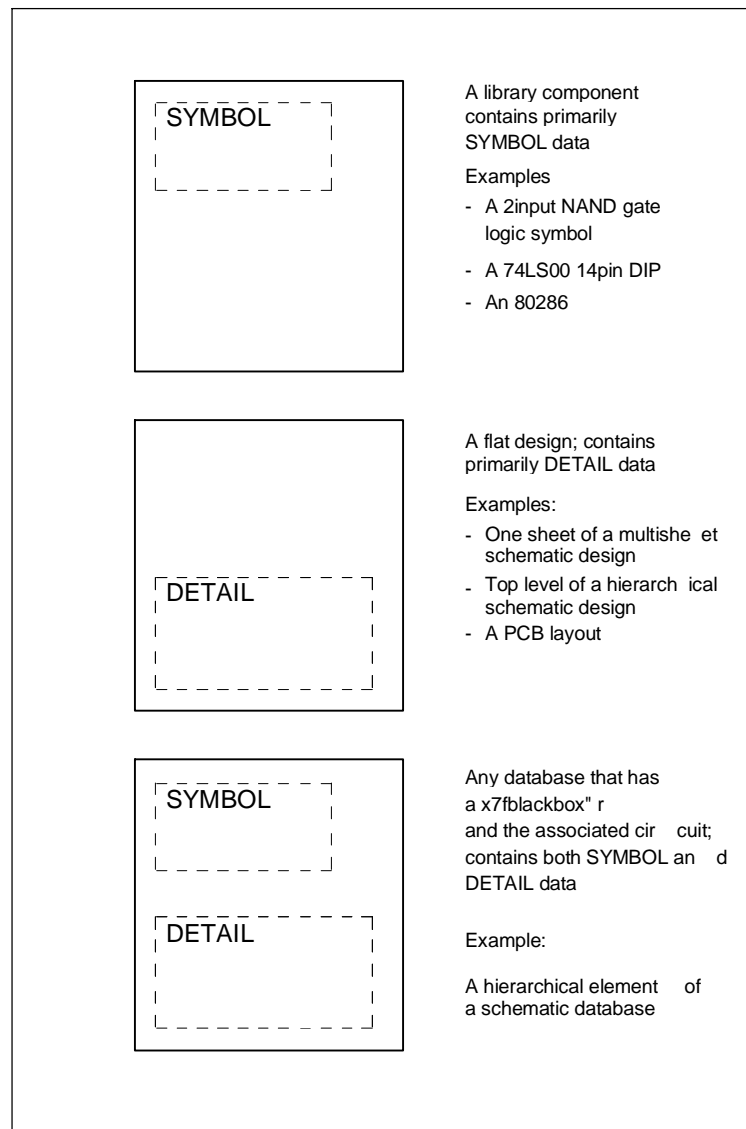
The PDIF file is organized into two major sections that correspond to the two views of a P-CAD design database file. The SYMBOL section corresponds to symbol and part databases; the DETAIL section corresponds to schematic, PCB, symbol library, and part library databases. This structure is shown in Figure 1-1.



**Figure 1-1. P-CAD Database Structure**

Like a P-CAD database file, a PDIF file can contain data in either or both of these two sections. Figure 1-2 shows the types of databases and the data contained in each section.

Library components are stored in files that contain primarily SYMBOL data, including graphic data and pin information. Schematic and PCB database files, and symbol library and part library database files, contain primarily DETAIL data, including library components, their locations, and their connections.

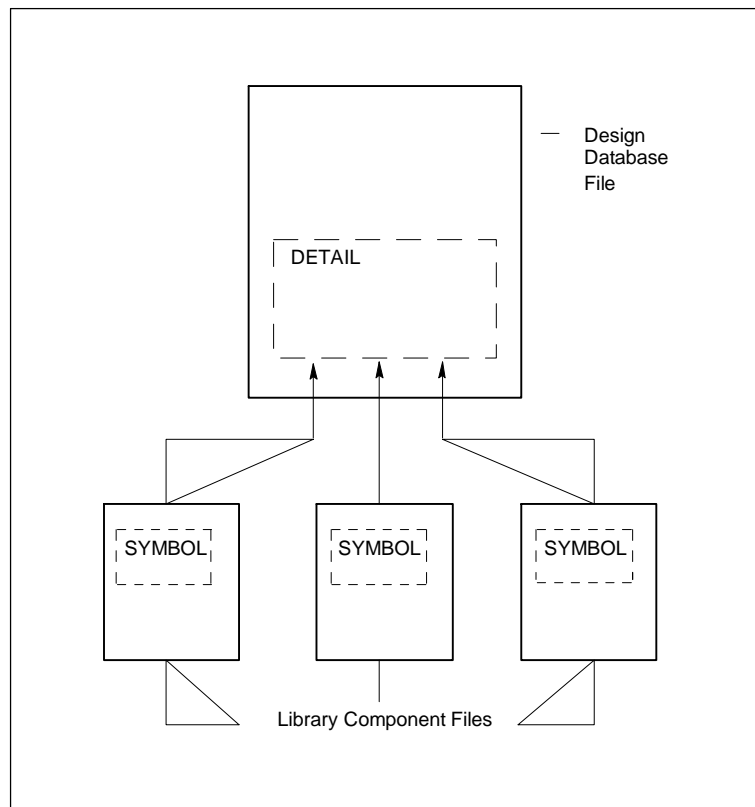


**Figure 1-2. PDIF File Structure for Different Database Types**

PCB databases are constructed as flat designs. Schematic databases can be flat but often are constructed using multisheet hierarchical designs, which use more than one file per design. The following sections describe flat, multisheet, and hierarchical structure.

## Flat Design Structure

A flat design consists of library components placed directly on the design, as shown in Figure 1-3.



**Figure 1-3. Flat Design Structure**

The design database file contains DETAIL data, while the library symbols contain primarily SYMBOL data. In the PDIF file, as in the design database file, the SYMBOL data from the component files is included in the DETAIL section of the design file.

## Multisheet Schematic Structure

A schematic design can consist of several different interconnected schematic drawings. Each drawing is called a sheet and is stored in a separate file. Figure 1-4 shows multisheet structure.

Each sheet is a separate PDIF file. As in a flat design, the SYMBOL data from the component files is included in the DETAIL section of the schematic file.

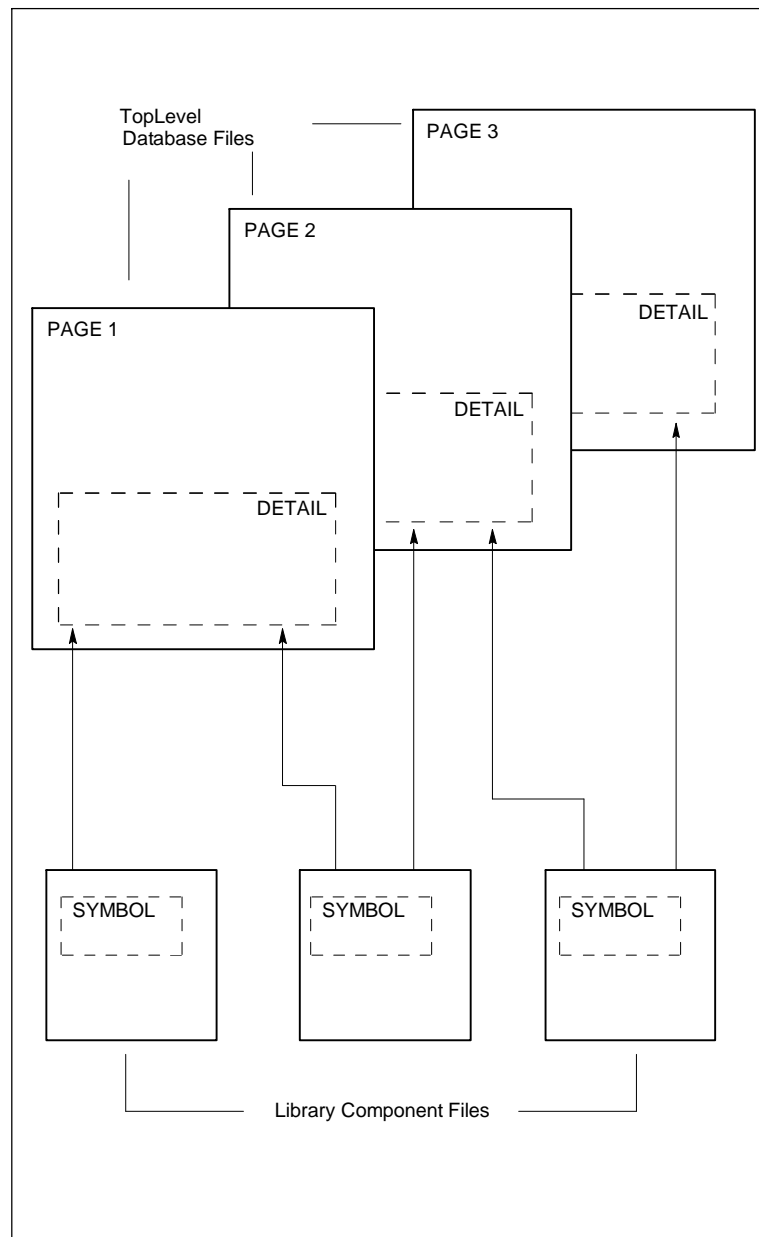
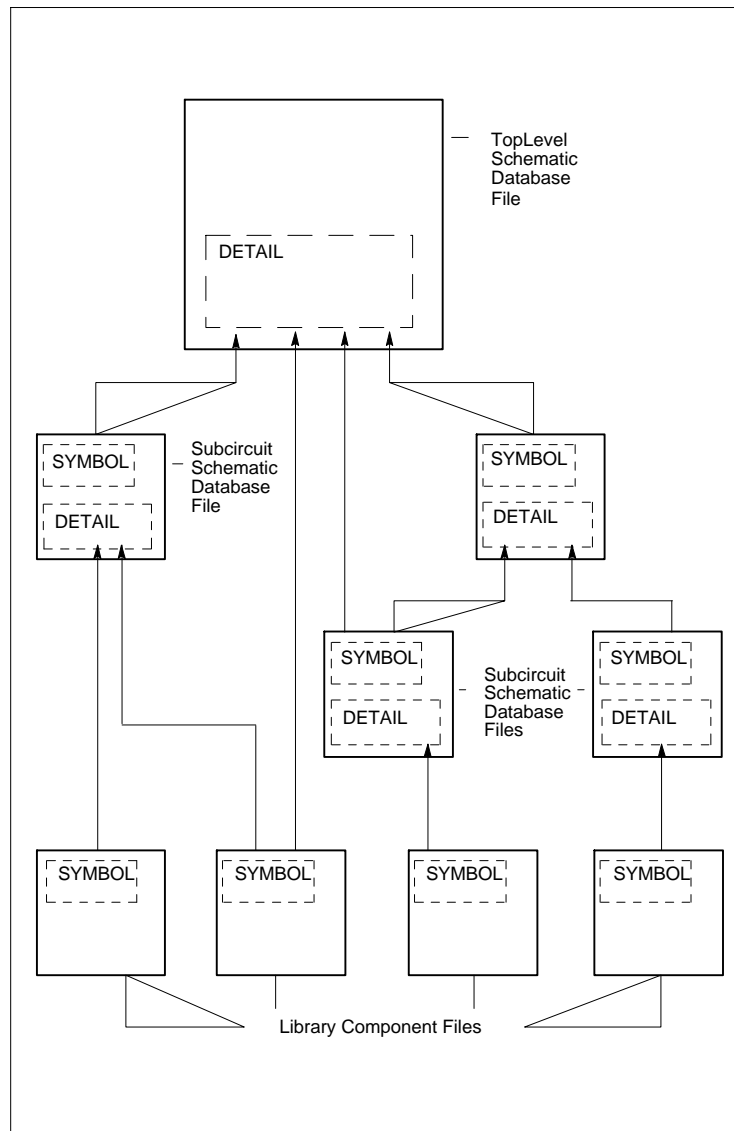


Figure 1-4. Multisheet Schematic Structure

## Hierarchical Schematic Structure

Hierarchical structure uses symbols to represent subcircuits in a schematic design. Figure 1-5 shows this type of structure. In Figure 1-5, each file is a separate PDIF database file. The top level is flat and contains primarily DETAIL data, while the library components contain primarily SYMBOL data. The user-defined

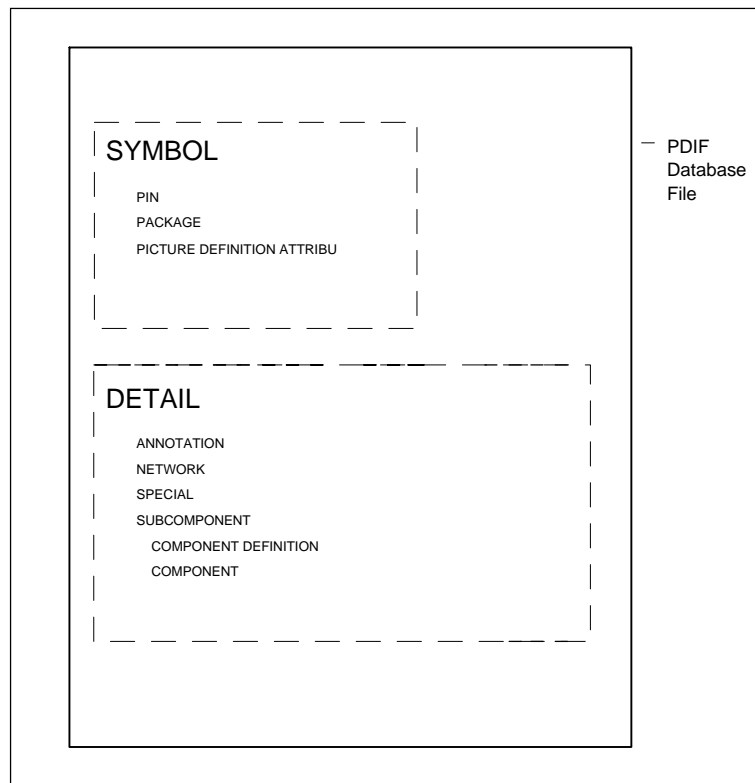
subcircuits contain both SYMBOL and DETAIL data. The SYMBOL data at any level of hierarchy is included in the DETAIL section of the next higher level.



**Figure 1-5. Hierarchical Schematic Structure**

## PDIF Database Substructure

Figure 1-6 shows the PDIF database structure in more depth. The SYMBOL section of the database file contains all the data pertaining to the black-box representation of the design, and the DETAIL section contains the actual circuit represented by the black box.



**Figure 1-6. PDIF File Substructure**

## File Format

The PDIF file consists of an identifier and seven sections in the format shown below.

```
{COMPONENT dbf
{MEM_TABLE
...
}
{ENVIRONMENT
...
}
{USER
...
}
{DISPLAY
...
}
{APERTURE_TABLE
...
}
{SYMBOL
... }
{DETAIL
... }
}
```

where

**COMPONENT** identifies the file as a PDIF file.

**dbf** is the filename of the P-CAD database that corresponds to the PDIF file.

**Blank lines and spaces** can be inserted anywhere and are a convenient way of partitioning data for readability.

**MEM\_TABLE**, **ENVIRONMENT**, **USER**, **DISPLAY**, **APERTURE\_TABLE**, **SYMBOL**, and **DETAIL** are the six sections of the file.

**{ }** (braces) enclose the entire file and each section within the file.

**...** (ellipses) indicate that the section contains more data.

Each section can contain data identified by PDIF keywords and values. A section can also have one or more subsections. Figure 1-7 shows the hierarchy of sections and subsections. (The periods are present only to clarify the hierarchy.)

COMPONENT	Lq	Org
MEM_TABLE	Ploc	Ty
ENVIRONMENT	PKG	Smd
PDIFvrev	Rdl	PIC
Program	Pnl	Arc
DBtype	Pid	C
DBvrev	Sd	Fl
DBtime	SPKG	Fr
DBunit	Sna	L
DBgrid	Sp	R
Lyrstr	Apn	T
Lyrphid	PIC	Poly
Ssymtbl	Arc	Polyap
Apr	C	OI
PCLR	Fl	Pv
Polyap	Fr	Cv
PSIZ	L	Pv
ROTP	R	Cv
SSTfile	T	SUBCOMP
USER	Poly	COMP_DEF
VIEW	Polyap	Als
Mode	OI	PIN_DEF
Vw	Pv	P
Lv	Cv	Pt
Gs	Pv	Lq
RCTL	Cv	Ploc
DISPLAY	ATR	PKG
Afn	IN	Rdl
Amt	Org	Pnl
Apt	Ty	Pid
Ly	Smd	Sd
Ls	Jmp	SPKG
Wd	Ex	Sna
Ts	At	Sp
Tj	DETAIL	Apn
Tr	ANNOTATE	PIC
Tm	Arc	Arc
Dwd	C	C
Dts	Fr	Fl
Daft	L	Fr
Cent	R	L
Elf	T	R
Eba	Poly	T
Dli	Polyap	Poly
Dtl	OI	Polyap
Dpt	Pv	OI
Dmt	Cv	Pv
Dtd	Pv	Cv
Dor	Cv	Pv
Dlt	DIMENSION	Cv
Lss	DArc	ATR
Mas	DC	IN
Gdt	DL	TY
Ds	DT	SMD
Ddu	DR	Jmp
Dus	DS	EX
Pfc	DS	EX
APERTURE TABLE	Arrow	At
Apfile	NET_DEF	I
Apver	N	CN
Aprnum	DG	IPT
Shp	W	ASG
Dcode	V	Pid
Owd	Arc	Rd
lwd	Poly	Pn
Oht	Polyap	ATR
Iht	OI	In
Odia	Pv	Pl
Idia	Cv	Sc
Sides	Nn	Ro
Aprot	ATR	Mr
Ti	IN	Ps
Twid	Ns	Pa
Ta	Rats	NI
Apcomm	Un	Un
Aptype	PAD_STACK	Smd
Symbol	Pad	Sna
PIN_DEF	PAD_DEF	lat
P	ATR	EX
Pt	IN	At



In some cases, the USER and DISPLAY sections might not be present. In addition, not all the subsections are used for all types of databases. For example, a schematic database doesn't contain the SPKG subsection. Some subsections must always be present but can be empty.

Note that some subsections are used more than once in the file. For example, all the subsections of COMP\_DEF in the DETAIL section are the same as the subsections of the SYMBOL section.

Table 1-1 lists in alphabetical order the PDIF sections and subsections and the database types they're used for. The table also shows the hierarchical paths in the PDIF file to each subsection, with a slash between the section and relevant subsection. For example, the COMP\_DEF section's path is DETAIL/SUBCOMP, which means that COMP\_DEF is a subsection of SUBCOMP, which is a subsection of DETAIL. The COMPONENT heading, which is the root of all paths, isn't listed in the table.

## Reserved Characters

In PDIF file syntax, the following reserved characters have specific meanings.

% ( ) [ ] { } " blank

Component names, net names, text, or attributes in a P-CAD database file sometimes contain reserved characters; for example, an attribute might contain quotation marks and blank spaces, or descriptive text might contain blank spaces.

When a reserved character in a PDIF file is preceded by a backslash ( \ ), PDIF interprets it as a part of the text. If a backslash is used as a text character, a double backslash ( \\ ) identifies it as text. Use  to indicate a blank.

**Note:** When PDIF syntax requires quotation marks with keywords, the backslash isn't required.

PDIF File Writer includes an option that lets you choose whether or not to search P-CAD input files for reserved characters and insert the character before each one. If you use reserved characters in your P-CAD file, fill the Scan Reserved Characters check box before you run PDIF File Writer. If you take care not to use reserved characters, or if you don't plan to use the PDIF file as input to PDIF File Reader, you can turn this option off and save time in file processing.

When PDIF File Reader encounters a backslash, the next character is used literally in the name, attribute, or text. An error may result if PDIF File Reader encounters a reserved character without the preceding backslash. For example, if an attribute value contains a blank space, the characters after the blank space could be omitted. Or, if the } character is used in a net name, PDIF File Reader considers the } to be the end of the section.

**Table 1-1. PDIF File Sections and Subsections**

<b>Name</b>	<b>Database</b>	<b>Path</b>
ANNOTATE	SCH, PCB	DETAIL
APERTURE_TABLE	PCB, PRT	APERTURE_TABLE
ASG	SCH, PCB	DETAIL/SUBCOMP/I
ATR	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL
		DETAIL/NET_DEF/N
		DETAIL/PAD_STACK/PAD_DEF
		DETAIL/SUBCOMP/COMP_DEF
		DETAIL/SUBCOMP/I
CN	SCH, SLB, PCB, PLB	DETAIL/SUBCOMP/I
COMP_DEF	SCH, SLB, PCB, PLB	DETAIL/SUBCOMP
DETAIL	SCH, SLB, PCB, PLB	
DG	SCH, PCB	DETAIL/NET_DEF/N
DIMENSION	PCB	DETAIL/ANNOTATE
DISPLAY	SCH, SYM, SLB, PCB, PRT, PLB	
ENVIRONMENT	SCH, SYM, SLB, PCB, PRT, PLB	
EX	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/ATR
		DETAIL/SUBCOMP/COMP_DEF/ATR
		DETAIL/SUBCOMP/I/ATR
I	SCH, SLB, PCB, PLB	DETAIL/SUBCOMP
IN	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/ATR
		DETAIL/PAD_STACK/PAD_DEF/ATR
		DETAIL/SUBCOMP/COMP_DEF//ATR
		DETAIL/SUBCOMP/I/ATR
IPT	SLB, PCB, PLB	DETAIL/SUBCOMP/I
MEM_TABLE	SLB, PLB	
N	SCH, SYM,	
	PCB, PRT	DETAIL/NET_DEF
NET_DEF	SCH, SYM,	DETAIL
	PCB, PRT	
P	SCH, PCB	SYMBOL/PIN_DEF
		DETAIL/SUBCOMP/COMP_DEF/PIN_DEF

PAD_DEF	PCB	DETAIL/PAD_STACK
PAD_STACK	PCB	DETAIL
PIC	SCH, SYM, SLB,	SYMBOL
	PCB, PRT, PLB	DETAIL/PAD_STACK/PAD_DEF
		DETAIL/SUBCOMP/COMP_DEF
PIN_DEF	SCH, SYM, SLB,	SYMBOL
	PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF
PKG	SCH, SYM, SLB	SYMBOL
		DETAIL/SUBCOMP/COMP_DEF
SPKG	PCB, PRT, PLB	SYMBOL
		DETAIL/SUBCOMP/COMP_DEF
SUBCOMP	SCH, SLB,	DETAIL
	PCB, PLB	
SYMBOL	SCH, SYM, SLB,	
	PCB, PRT, PLB	
<system>	SCH, SYM, SLB,	USER
	PCB, PRT, PLB	
USER	SCH, SYM, SLB,	
	PCB, PRT, PLB	
VIEW	SCH, SYM, SLB,	USER
	PCB, PRT, PLB	



# Section and Keyword Reference

---

## 2

This section describes each section, subsection, and keyword of the PDIF file. Keywords, sections, and subsections are listed in alphabetical order. Keywords serve as database creation commands and define the various aspects that make up the database.

Each section description contains the following parts:

### **Section It's Found In**

The hierarchical path of section and subsections that are parent to the subsection. This section only appears for subsection descriptions.

### **What It Does**

The purpose and contents of the section or subsection.

### **What It Looks Like**

The format of the section or subsection, including alternate formats if allowable and definitions of items if necessary.

### **Keywords It Contains**

Keywords and definitions for all keywords used in the section or subsection. Keywords are predefined words that specify values for certain parameters.

### **Example**

Example or examples of the section or subsection.

Each keyword description contains the following parts:

### **Databases That Use It**

Database types the keyword is used for. The types are Schematic, Symbol, Symbol Library, PCB, Part, and Part Library.

### **Where You Find It**

Paths in the PDIF file to the subsections where the keyword is used. This part isn't included for keywords that are used in the five main sections of the PDIF file.

### **What It Does**

Brief description of the function of the keyword.

### **What It Looks Like**

Format used for the keyword.

### Other Things You Need to Know

Additional information about the use of the keyword.

### Example

Specific examples of the keyword.

### P-CAD Cross-Reference

P-CAD command or status area option that corresponds to the keyword. For more information about the P-CAD commands, refer to the *Command Reference* manual.

The notation used with the section, subsection, and keyword reference is shown in Table 2-1.

**Table 2-1. PDIF File Notation**

<b>Symbol</b>	<b>Meaning</b>
<b>UPPERCASE</b>	Section and subsection names are shown in uppercase.
<b>lowercase</b>	Keywords and variable names representing section, subsection, and keyword parameter values are shown in lowercase.
<b><u>Underline</u></b>	Keywords are underlined in the What It Looks Like part of section and subsection descriptions. They aren't underlined in the Example section or in the actual PDIF file.)
<b>" "</b>	Quotation marks are required where they are shown.
<b>...</b>	The ellipsis indicates that the section or keyword might contain additional data.
<b>%</b>	The percent sign indicates a comment. PDIF File Reader ignores all text from the % to the end of the line.
<b>{ }</b>	Braces enclose all sections and subsections and all keywords except for those enclosed in square brackets, described below.
<b>[ ]</b>	Square brackets enclose several keywords that define display and graphics information. These keywords are used in the DISPLAY section of the PDIF file to set initial conditions and are used again wherever these conditions change in the design.
<b>x y</b>	The x and y parameters refer to horizontal and vertical grid coordinates.

# Afn

(Arrowhead Filename)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the arrowhead filename for autodimension features.

---

## What It Looks Like

`[Afn "name" ]`  
where  
**name** is the filename of the arrowhead.

---

## Example

`[Afn "arrow.ah"]`

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Als

(Alias Count)

## Keyword

---

### Databases That Use It

Symbol Library

Part Library

---

### Where You Find It

DETAIL / SUBCOMP / COMP\_DEF

---

### What It Does

Shows the number of aliases for the specified component definition.

---

### What It Looks Like

```
{Als count}
```

where

**count** is the number of aliases.

---

### Example

```
{COMP_DEF 7400.prt  
{Als 16 }
```



# Amt

( Angular Dimension Minus Tolerance)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the angular dimension minus tolerance of autodimension features.

---

## What It Looks Like

[Amt n]

---

## Example

[Amt 0.01]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>	
PCB Editor	<i>Dimension</i>	Minus: 0

# ANNOTATE

## Subsection

---

## Section It's Found In

DETAIL

---

## What It Does

This subsection describes all drawing or layout annotations that are not pictures of the symbols, reference designators or instance names, pin names/numbers or wiring diagrams. For example, this subsection would contain a board outline or text placed on a design for user reference.

The format and the keywords of the ANNOTATE subsection are identical to those in the SYMBOL / PIC subsection.

---

## What It Looks Like

```
{ANNOTATE
  {T "string" x y}
  {L x1 y1 x2 y2 x3 y3 ...}
  {R x1 y1 x2 y2}
  {Fr x1 y1 x2 y2}
  {A cx cy r sa ea}
  {C cx cy r}
  {Fl x y a}
  {Poly
    {Ol type x1 y1 x2 y2 ...}
    {Pv x1 y1 x2 y2 ...}
    {Cv xc yc r}
  }
  {Pv x1 y1 x2 y2 ...}
  {Cv and xc yc r}
}
```

# ANNOTATE

## Keywords It Contains

T	text string
L	line segments
R	rectangle
Fr	filled rectangle
Arc	arc
C	circle
Fl	flash (for photoplotter graphics)
Poly	polygon
Polyap	polygon aperture size
OI	outline
Pv	polygonal void
Cv	circular void

## Example

```
{DETAIL
{ANNOTATE
[Ly "TEXT"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
{T "8" -30.00 1510.00}
{L 3190.00 -100.00 3150.00 -100.00 }
[Wd 5.00]
{C 2280.00 1100.00 10.00 }
}
```

# Apcomm

(Aperture Table Comments)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

APERTURE\_TABLE

---

### What It Does

Specifies an aperture table comment string.

---

### What It Looks Like

```
Apcomm "string"
```

where

**string** is a comment string.

---

### Example

```
{Apcomm "50 mil round line aperture with 30 mil hole"}
```

# Apcomm

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
<i>PCB Editor</i>	<i>Environment!Edit Aperture Table</i>
<i>Part Editor</i>	<i>Environment!Edit Aperture Table</i>

# APERTURE\_TABLE

Section

## What It Does

This section defines the contents of the integrated aperture table. The integrated aperture table contains one or more aperture files, each one describing a padstack.

Each padstack is described by its name, number, shape, Dcode, type, rotation, and dimensions.

The measurement unit used in the aperture table file is the same as in the database.

Text that describes aperture shapes and types are not case sensitive.

The APERTURE\_TABLE section is present only for PCB databases. It's optional since databases don't require storing an aperture table.

## What It Looks Like

```
{APERTURE_TABLE
  {Apfile filename}
  {Apver n}
  {Aprnum n}
  {Shp shape}
  {Dcode n}
  {Odia n}
  {Idia n}
  {Owd n}
  {Iwd n}
  {Oht n}
  {Iht n}
  {Sides n x1,y1 ... xn,yn}
  {Aprot n}
  {Ti n}
  {Tw d n}
  {Ta n}
  {Aptype type}
  {Apcomm "string"}
}
```

where

**filename** is the name of the aperture file.

**n** is a number.

**shape** is the aperture shape.

**x1,y1 ... xn,yn** are coordinates.

## APERTURE\_TABLE

**type** is the aperture type.

**string** is a comment string.

---

### Keywords It Contains

Apfile	name of the aperture file
Apver	aperture table version
Aprnum	aperture number
Shp	aperture shape
Dcode	aperture Dcode
Odia	outside diameter
Idia	inside diameter
Owd	aperture width
Oht	aperture height
Iwd	inner rectangular hole width
Iht	inner rectangular hole height
Sides	number of polygon sides and coordinate pairs
Aprot	aperture angle of rotation
Ti	number of ties in a thermal shape
Twid	width of ties in a thermal shape
Ta	starting angle for the first tie in a thermal shape
Aptype	aperture type
Apcomm	comment string

---

### Example

```
{APERTURE_TABLE
{Apfile pcad.apr}
{Apver 800}
{Aprnum 1
{Shp THERMAL}
{Dcode 10}
{Odia 90.00}
{Idia 50.00}
{Ti 4}
{Twid 25.00}
{Ta 45}
{Aptype FLASH}
}
{Aprnum 2
{Shp RECTANGLE}
{Dcode 11}
```

# APERTURE\_TABLE

```

{Owd 50.00}
{Oht 25.00}
{Iwd 10.00}
{Iht 10.00}
{Aprot 0}
{Aptype FLASH}

{Aprnum 3}
{Shp OVAL}
{Dcode 12}
{Owd 25.00}
{Oht 50.00}
{Aprot 45}
{Aptype FLASH}

{Aprnum 4}
{Shp POLYGON}
{Dcode 13}
{Sides 6 0.00 10.00 20.00 20.00 20.00 -
20.00 0.00 -30.00 -20.00 -20.00
-20.00 20.00}
{Aptype FLASH}

{Aprnum 5}
{Shp SPECIALX}
{Dcode 14}
{Owd 200.00}
{Oht 135.00}
{Apcomm "200mil x 135 mil DRC box."}
{Aptype FLASH}

{Aprnum 6}
{Shp SQUARE}
{Dcode 15}
{Owd 80.00}
{Idia 17.00}
{Aprot 45}
{Aptype FLASH}

{Aprnum 7}
{Shp TARGET}
{Dcode 16}
{Odia 120.00}
{Apcomm "5 mil cross hair"}
{Aptype FLASH}

```



# Apfile

(Aperture Table Filename)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the name of the aperture table file.

---

## What It Looks Like

`Apfile filename`

where

**filename** is the name of the aperture table file

---

## Example

`{Apfile pcd.adr}`

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
<i>PCB Editor</i>	<i>Environment!Edit Aperture Table</i>
<i>Part Editor</i>	<i>Environment!Edit Aperture Table</i>

# Apn

(Alphanumeric Pin Number)

## Keyword

---

### Databases That Use It

Schematic  
Part

---

### Where You Find It

SYMBOL / SPKG  
DETAIL / SUBCOMP / COMP\_DEF / SPKG

---

### What It Does

Shows alphanumeric pin numbers.

---

### What It Looks Like

```
{Apn num1 num2 ... }
```

where

**num1**, **num2**, and so on, are alphanumeric pin numbers. There's one pin number for each pin of the part. These pin numbers contain one to seven alphanumeric characters.

---

### Example

```
{Apn A1 A2 B1 }
```

# Apn

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter!Ref. Des. &amp; Section</i>
Part Editor	<i>Enter!Packaging Data</i>
	<i>Enter!Pin</i>

# Apr

(Aperture List)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Defines the apertures entered with the *Environment! Inner Plane Aperture* command.

---

### What It Looks Like

```
{Apr aper1 aper2...apern}
```

where

**aper1** to **apern** are the apertures that connect to an inverse image inner plane.

---

### Example

```
{Apr 20 32 95}
```

---

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Inner Plane Apertures</i>

# Aprnum

(Aperture Number)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the number of the aperture within the aperture table.

---

## What It Looks Like

```
{Aprnum n
```

where

**n** is the aperture number, from 1 to 999.

---

## Other Things You Need to Know

Aperture numbers must be consecutive, from 1 to 999. The aperture table must start with 1; if the aperture table doesn't start with 1, PDIF will display error messages and won't create the aperture table. If the aperture table contains numbers beyond 999, PDIF will display warning messages, ignore the extra aperture numbers, and continue processing. If an aperture number is out of order or missing, PDIF will build the table of apertures up to the incorrect aperture number and then display error messages from that point on.

---

## Example

```
{Aprnum 1
```

# Aprnum

---

## P-CAD Cross-Reference

<i><b>Editor</b></i>	<i><b>View Layer Screen Option</b></i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Aprot

(Aperture Rotation)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the angle of rotation of a rectangular or oval aperture.

---

## What It Looks Like

`{Aprot n}`

where

**n** is an integer.

---

## Example

`{Aprot 45}`

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Environment! Edit Aperture Table
Part Editor	Environment! Edit Aperture Table

# Apt

(Angular Dimension Plus Tolerance)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DISPLAY, where required

---

### What It Does

Specifies the angular dimension plus tolerance of autodimension features.

---

### What It Looks Like

[Apt n]

---

### Example

[Apt 0.01]

---

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Angular</i> Plus: 0



# Aptype

(Aperture Type)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the aperture type—flash or line.

---

## What It Looks Like

```
{Aptype type}
```

where

type is either Flash or Line.

---

## Example

```
{Aptype FLASH}
```

# Aptype

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Apver

(Aperture Table Version)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the version number of the aperture table attached to the PCB database.

---

## What It Looks Like

[Apver n ]

where

**n** is the aperture table version number.

---

## Example

[Apver 2.0]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Arc

(Arc)

## Keyword

---

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

### Where You Find It

SYMBOL / PIC  
DETAIL / ANNOTATE  
DETAIL / PAD\_STACK / PAD\_DEF / PIC  
DETAIL / SUBCOMP / COMP\_DEF / PIC  
DETAIL / NETDEF / DG

---

### What It Does

Specifies an arc.

---

### What It Looks Like

`{Arc cx cy sx sy ex ey}`

where

**cx** is the center x coordinate.

**cy** is the center y coordinate.

**sx** is the start x coordinate.

**sy** is the start y coordinate.

**ex** is the end x coordinate.

**ey** is the end y coordinate.

# Arc

---

## Other Things You Need to Know

An arc is identified using the center coordinates *cx* and the coordinates of the start and end points. The arc must be circular (that is, the start and end points must be equidistant from the center point). The arc is drawn counterclockwise from *sx*, *sy* to *ex*, *ey*.

---

## Example

```
{Arc 108.00 675.00 108.00 680.00 108.00 670.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw!2-Point Arc</i>
	<i>Draw!3-Point Arc</i>

# Arrow

(Arrow Type)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DIMENSION

---

### What It Does

Specifies the invocation name of a unique arrowhead component.

---

### What It Looks Like

```
{Arrow inv_name}
```

where

**inv\_name** is the invocation name.

---

### Example

```
{Arrow XCA2}
```

---

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Configure</i>

# ASG

(Symbol Packaging Information)

## Subsection

---

### Section It's Found In

DETAIL / SUBCOMP / I

---

### What It Does

This subsection specifies the packaging information of a schematic component, including its reference designator, designator location, and the package pin numbers corresponding to its logical pins. The ASG subsection exists in schematic databases only.

The order of Pn subsections is the same as the order of P subsections in the COMP\_DEF / PIN\_DEF section for the component type.

---

### What It Looks Like

```
{ASG
  {Rd "rd" x y}
  {Pn "an" x y}
  {Pn "an" x y}
  {Pn "an" x y}
  . . .
}
```

---

### Keywords It Contains

Rd	reference designator
Pn	package pin numbers

# ASG

---

## Example

```
{ASG A
  [Ly "REFDES"]
  [Ts 25.00][Tj "CB"][Tr 0][Tm "N"]
  {Rd "U9" 108.00 661.00}
  [Ly "PINNUM"]
  [Ts 15.00][Tj "LC"]
  {Pn "57" 210.00 670.00}
}
```



# At

(User-Defined Attribute)

## Keyword

---

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

### Where You Find It

SYMBOL / ATR / EX  
DETAIL / SUBCOMP / COMP\_DEF / ATR / EX  
DETAIL / SUBCOMP / I / ATR / EX

---

### What It Does

Shows a user-specified component attribute and its location.

---

### What It Looks Like

`{At key value x y}`  
where  
**key** is the attribute keyword.  
**value** is the user-defined value.  
**x** is the x coordinate.  
**y** is the y coordinate.

---

### Other Things You Need to Know

The attribute keyword is a text string that defines the value. It can be up to 8 characters long and must start with a letter.

# At

The value is a text string up to 39 characters. If it begins with a quotation mark or an open parenthesis, it consists of everything up to and including the matching quotation mark or close parenthesis.

In the SYMBOL section, the attribute location is the absolute location coordinate.

In the COMP\_DEF subsection of the DETAIL section, the location given is relative to the component origin and assumes no scaling, mirroring, or rotation. Absolute database location is calculated by using values of PI, Sc, Mr, and Ro for the component instance.

In the I subsection of the DETAIL section, the location given also is relative to the component origin after any scaling, mirroring, and rotation.

---

## Example

```
{At SHEET E 0.50 0.00}  
{At VALUE 74F138 -90.00 -45.00}  
{At FP DIP20 850.00 150.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter!Attribute</i>
PCB Editor	<i>Enter!Sheet Number</i>
Part Editor	<i>Enter!Attribute</i>

# ATR

*(Symbol Attributes)***Subsection**

---

**Section It's Found In**

SYMBOL  
 DETAIL / PAD\_STACK / PAD\_DEF  
 DETAIL / SUBCOMP / COMP\_DEF  
 DETAIL / NET\_DEF / N

---

**What It Does**

The ATR subsection defines the symbol attributes. The two subsections, IN and EX, are also described in this section.

The IN subsection defines internal attributes and includes the origin (reference point) for the symbol and the symbol's component type.

The EX subsection defines external, or user-defined attributes such as timing or simulation parameters, manufacturing part numbers, and so on. A database can have any number of user-defined attributes.

Note that the ATR subsection under DETAIL / SUBCOMP / I uses different keywords and is described separately in this chapter.

---

**What It Looks Like**

```
{ATR
  {IN
    {Org x y}
    {Ty n}
    {Smd f}
  }
  {EX
    {At key value x y}
    {At key value x y}
    . . .
  }
}
```

# ATR

---

## Keywords It Contains

Org	reference point for the symbol
Ty	component type
At	user-defined attribute
Smd	surface-mounted device (for a part database only)
Jump	jumper (for a part database only)

---

## Example

```
{ATR
  {IN
    {Org -21474836.47 -21474836.47}
    {Ty 255}
    {Smd "Y"}
    {Jump "Y"}
  }
  {EX
    [Ly "ATTR"]
    [Ts 0.01][Tj "LC"][Tr 1][Tm "Y"]
    {At SHEET E 0.50 0.00}
  }
}
```

# ATR

*(Instance-specific Attributes)***Subsection**

---

**Section It's Found In**

DETAIL / SUBCOMP / I

---

**What It Does**

This subsection defines a component's instance-specific internal and external attributes, in the IN and EX subsections, respectively. This subsection uses different keywords and gives different information than the ATR subsections in the SYMBOL, PAD\_STACK, and COMP\_DEF sections.

---

**What It Looks Like**

```

{ATR
  {IN
    {Pl x y}
    {Sc sx sy}
    {Ro n}
    {Pa d}
    {Mr "m"}
    {Ps "s"}
    {Nl x y}
    {Un "f"}
    {Iat key value}
  }
  {EX
    {At key value x y}
    {At key value x y}
    . . .
  }
}

```

# ATR

---

## Keywords It Contains

Pl	placement coordinates
Sc	x and y scaling factors
Ro	rotation
Mr	placement mirroring status (schematic database only)
Nl	name location of component instance
Ps	placement side (PCB database only)
Pa	placement angle
Un	user-assigned name (schematic database only)
At	user-defined attributes
lat	P-CAD internal attributes

---

## Example

```
{ATR
  {IN
    {Pl 540.00 1360.00}
    {Mr "Y"}
  }
  {EX
    [Ly "ATTR"]
    [Ts 20.00][Tj "CT"][Tr 0][Tm "N"]
    {At VALUE 74F138 -90.00 -45.00}
  }
}
```

**C***(Circle)***Keyword**

---

**Databases That Use It**

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

**Where You Find It**

SYMBOL / PIC  
 DETAIL / ANNOTATE  
 DETAIL / PAD\_STACK / PAD\_DEF / PIC  
 DETAIL / SUBCOMP / COMP\_DEF / PIC

---

**What It Does**

Specifies a circle.

---

**What It Looks Like**

$$\{\underline{C} \text{ } cx \text{ } cy \text{ } r\}$$

where

**cx** is the center x coordinate.

**cy** is the center y coordinate.

**r** is the radius.

---

**Other Things You Need to Know**

A circle is identified by the center coordinates cx and cy, and the radius r.

# C

---

## Example

```
{C 205.00 550.00 5.00 }  
{C 2280.00 1100.00 10.00 }  
{C 9150.00 7850.00 60.00 }  
{C 9150.00 10250.00 60.00 }  
{C -3550.00 11450.00 60.00 }
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw! Circle</i>



# Cent

(Center Line Size)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the center line size of circle.

---

## What It Looks Like

[Cent n]

---

## Example

[Cent 80.00]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Dimension! Configure

# CN

(Component-to-Net Connectivity)

## Subsection

---

### Section It's Found In

DETAIL / SUBCOMP / I

---

### What It Does

The CN subsection defines the component-to-net connectivities. This subsection is essentially the network topology of the database.

---

### What It Looks Like

The CN subsection can be in either of two formats. The first format includes pin names as shown below.

```
{CN
  pinname net pinname net pinname net . . .
}
```

where

**pinname** is the name of a pin, assigned in the P-CAD system using the *Enter!Pin* command in the Schematic or PCB Editor. PDIF File Reader also accepts an asterisk (\*) to indicate "don't care" for the pin name. If the asterisk is used in the CN subsection, all pin names in the subsection must have asterisks.

**net** is the name of the net the pin is connected to. In the P-CAD system, the net name is assigned using the *Name!Net* command in the Schematic or PCB Editor. In a PCB database, PDIF File Writer assigns names to unnamed nets in the format *XNnnnnn*, where *nnnnn* is a five-digit integer assigned sequentially starting with 00000. In a schematic database, PDIF File Writer assigns names to unnamed nets in the format *UNssssnnnn*, where *ssss* is the sheet identification and *nnnn* is the sheet number. Both are assigned sequentially starting with 0000. If the pin isn't connected to a net, a question mark is used instead of the net name.

The sequence of the pins follows the pin order defined in the COMP\_DEF / PIN\_DEF section for the component type.

## CN

The second format doesn't include pin names. This format is useful in translating databases to or from a CAD system that doesn't use pin names. This format is shown below.

```
{CN
  net net net . . .
}
```

where

**net** is the name of the net the pin is connected to, as described above.

The sequence of the pins follows the pin order defined in the COMP\_DEF / PIN\_DEF section for the component type.

PDIF File Writer can create the CN section in either format, depending on whether the *List Pin Names in Component* option is active or not.

When the CN section has net names but no pin names, PDIF File Reader creates connections based on the pin order in the COMP\_DEF section (internal mode) or component file pin order (external mode). However, when the CN section has pin names, PDIF File Reader creates connections by pin name, independent of pin order. In this case, you could change the component file pin ordering, then run PDIF File Reader in external mode, and PDIF File Reader would create the proper connections.

---

## Example

**Example 1** – Shows that the first pin of the component is connected to a signal called CHIPSEL', the second pin to ADDR15, the third to ADDR14, and the fourth pin is unconnected.

```
{CN
  Y CHIPSEL' A ADDR15 B ADDR14 C ?
}
```

**Example 2** – Shows the same component as Example 1, with no pin names.

```
{CN
  CHIPSEL' ADDR15 ADDR14 ?
}
```

# COMP\_DEF

*(Component Definition)*

## Subsection

---

### Section It's Found In

DETAIL / SUBCOMP

---

### What It Does

Each COMP\_DEF subsection defines a component in a design database. A PDIF file contains as many COMP\_DEF subsections as there are unique components used.

The COMP\_DEF subsection for a component in a design contains the same information that would be in the SYMBOL section of the PDIF file for the component if it were created.

The COMP\_DEF subsection contains the same subsections as the SYMBOL section. The ATR / EX subsection isn't produced by PDIF File Writer in the COMP\_DEF subsection, but is recognized by PDIF File Reader. The PKG subsection is present only for schematic databases and the SPKG subsection is present only for PCB part databases. Refer to the descriptions of the SYMBOL subsections for further information.

PDIF File Writer doesn't produce a COMP\_DEF subsection in the PDIF file for a database with no DETAIL data, such as a schematic library symbol or PCB part.

When creating a PDIF file to input to PDIF File Reader, the COMP\_DEF subsection isn't necessary, if an external symbol or part file exists for the component and the Import Components cycle box is set to External when running PDIF File Reader.

# COMP\_DEF

## What It Looks Like

```
{COMP_DEF filename
  {PIN_DEF
    . . .
  }
  {PKG                      % schematic only
    . . .
  }
  {SPKG                     % PCB only
    . . .
  }
  {PIC
    . . .
  }
  {ATR
    . . .
  }
}
```

where

**filename** is the name of the component file.

## Keywords It Contains

Als      alias count (only in symbol and part library databases)

## Example

**Example 1** – Defines a 74ls04 symbol.

```
{COMP_DEF 74ls04.sym
  {PIN_DEF
    [Ly "PINCON"]
    {P OUT {Pt "OUTPUT"}{Lq 0}{Ploc 140.00 0.00}}
    {P IN {Pt "INPUT"}{Lq 0}{Ploc 0.00 0.00}}
  }
  {PKG
    [Ly "REFDES"]
    [Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
    {Rdl 60.00 0.00}
    [Ly "PINNUM"]
    [Ts 15.00][Tj "LC"]
    {Pnl 115.00 10.00}
```

```
[Tj "RC"]  
{Pn1 25.00 10.00}
```

# COMP\_DEF

```

{Pid 7404}
{Sd A 2 1}
{Sd B 4 3}
{Sd C 6 5}
{Sd D 8 9}
{Sd E 10 11}
{Sd F 12 13}
}
{PIC
  [Ly "GATE"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "RC"][Tr 0][Tm "N"]
  {L 40.00 35.00 40.00 -35.00 }
  {L 40.00 0.00 0.00 0.00 }
  {L 40.00 35.00 100.00 0.00 40.00 -35.00 }
  {C 107.00 0.00 7.00 }
  {L 140.00 0.00 114.00 0.00 }
  [Ly "IEEE"]
  {L 100.00 10.00 115.00 0.00 }
  {L 0.00 0.00 30.00 0.00 }
  {L 100.00 0.00 140.00 0.00 }
  {R 30.00 -35.00 100.00 35.00 }
  [Ly "DEVICE"]
  [Tj "LC"]
  {T "74LS04" 40.00 -46.00}
  [Ly "PINFUN"]
  [Tj "CC"]
  {T "1" 70.00 25.00}
}
{ATR
  {IN
    {Ty 255}
  }
}
}
{I 74ls04.sym UC00000002
  {CN UN00000005 INP}
  {ATR
    {IN
      {Pl -430.00 110.00}
      {Ro 3}
    }
  }
}
}
}
}
}
}
}

```

# COMP\_DEF

**Example 2** – Defines a 74ls04 part.

```
{COMP_DEF 74ls04.prt
{PIN_DEF
  [Ly "PIN"]
  {P 1 {Pt 1}{Lq 0}{Ploc 0.00 0.00}}
  {P 2 {Pt 2}{Lq 0}{Ploc 0.00 -100.00}}
  {P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
  {P 4 {Pt 2}{Lq 0}{Ploc 0.00 -300.00}}
  {P 5 {Pt 2}{Lq 0}{Ploc 0.00 -400.00}}
  {P 6 {Pt 2}{Lq 0}{Ploc 0.00 -500.00}}
  {P 7 {Pt 3}{Lq 0}{Ploc 0.00 -600.00}}
  {P 8 {Pt 2}{Lq 0}{Ploc 300.00 -600.00}}
  {P 9 {Pt 2}{Lq 0}{Ploc 300.00 -500.00}}
  {P 10 {Pt 2}{Lq 0}{Ploc 300.00 -400.00}}
  {P 11 {Pt 2}{Lq 0}{Ploc 300.00 -300.00}}
  {P 12 {Pt 2}{Lq 0}{Ploc 300.00 -200.00}}
  {P 13 {Pt 2}{Lq 0}{Ploc 300.00 -100.00}}
  {P 14 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
}
{SPKG
  {Sna A B C D E F}
  {Sp OUT 2 4 6 8 10 12}
  {Sp IN 1 3 5 9 11 13}
}

{PIC
  [Ly "SLKSCR"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
  {R 50.00 -650.00 250.00 50.00 }
  {L 100.00 50.00 150.00 0.00 200.00 50.00 }
  [Ly "DEVICE"]
  [Ts 125.00][Tr 3]
  {T "74LS04" 150.00 -300.00}
}
{ATR
  {IN
    {Ty 10000}
  }
}
}
{I 74ls04.prt U17
  {CN UN001029 UN001032 UN001032 UN001033 UN001028
UN001030 ?
  ? ? ? ? ? ? }
  {ATR
    {IN
      {Pl 1500.00 3150.00}
      {Ro 1}
      {Iat $GRP003 GROUP10 }
      {Iat $GRP001 GROUP10 }
      {Iat $GRP002 GROUP10 }
      {Iat FIXED 1 }
    }
  }
}
```



# COMP\_DEF

```
{EX
  [Ly "$$NULL" ]
  [Ly "$$NULL" ]
  [Ly "$$NULL" ]
  [Ly "$$NULL" ]
  [Ly "ATTR" ]
  [Ts 40.00][Tj "CB"][Tr 0]
  {At FP DIP14 650.00 150.00}
}
}
```

**Cv**

(Circular Void)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

SYMBOL / PIC  
SYMBOL / PIC / POLY  
DETAIL / ANNOTATE  
DETAIL / ANNOTATE / POLY  
DETAIL / NET-DEF / N / DG / POLY  
DETAIL / PAD\_STACK / PAD\_DEF / PIC  
DETAIL / PAD\_STACK / PAD\_DEF / PIC / POLY  
DETAIL / SUBCOMP / COMP\_DEF / PIC  
DETAIL / SUBCOMP / COMP\_DEF / PIC / POLY

---

## What It Does

Specifies a circular void. A void in a poly subsection is associated with that polygon. Any other void isn't associated with a polygon.

---

## What It Looks Like

$\{\text{Cv } x \ y \ r\}$

where

**x** is the x coordinate of center.

**y** is the y coordinate of center.

**r** is the radius of the circular void.

# Cv

---

## Example

```
{Cv 0.00 0.00 141.99 }  
{Cv 0.00 0.00 127.00 }  
{Cv 0.00 0.00 127.00 }
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Draw! Circular Void</i>
Part Editor	<i>Draw! Circular Void</i>

# Daft

(Digits After Decimal)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the number of digits after a decimal for autodimensioning text.

---

## What It Looks Like

[Daft n]

where

**n** is an integer.

---

## Example

[Daft 3]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Configure</i>

# DArc

(Dimension-Arc)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DETAIL / ANNOTATE / DIMENSION

---

### What It Does

Specifies an arc used in dimensioning.

---

### What It Looks Like

```
{DArc cx cy sx sy ex ey}
```

where

**cx** is the center x coordinate.

**cy** is the center y coordinate.

**sx** is the start x coordinate.

**sy** is the start y coordinate.

**ex** is the end x coordinate.

**ey** is the end y coordinate.

---

### Other Things You Need to Know

An arc is identified using the center coordinates **cx** and the coordinates of the start and end points. The arc must be circular (that is, the start and end points must be equidistant from the center point). The arc is drawn counterclockwise from **sx**, **sy** to **ex**, **ey**.

# **DArc**

---

## **Example**

```
{DArc 250.00 3000.00 -881.24 2841.01 -831.48 2632.06}
```

---

## **P-CAD Cross-Reference**

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension\Bind</i>

# DBgrid

(Database Grid)

## Keyword

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

### Where You Find It

ENVIRONMENT

### What It Does

Specifies the database grid.

### What It Looks Like

`{DBgrid n}`  
 where  
 n is the number of units per DBU (integer). Unit is defined by the DBunit keyword.

### Other Things You Need to Know

This keyword, together with DBunit, defines the relationship of the grid (working area) to a unit of measurement. In the P-CAD system, these values are not user-changeable. These keywords are for interfacing to other systems that use other values.

For any P-CAD design, the total working area is 1,000,000 by 1,000,000 database units (DBUs).

## DBgrid

For a schematic database, DBgrid is always 10, so that if DBunit is CENTIMIL, the P-CAD DBU is .10 mils.

For a PCB database, DBgrid is 1, so if the DBunit is CENTIMIL, the DBU is .01 mil.

---

### Example

```
{DBgrid 10}  
{DBgrid 1}
```



# DBtime

(Database Time-Stamp)

## Keyword

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

### Where You Find It

ENVIRONMENT

### What It Does

Shows when the database was created.

### What It Looks Like

```
{DBtime "time_stamp"}
```

where

**time\_stamp** is in the format:

"mmm. dd, yyyy hh:mm x.m."

where

"**mmm.**" is the month (three characters and a period).

**dd,** is the day (2-digit integer and a comma).

**yyyy** is the year (4-digit integer).

**hh** is the hour (2-digit integer).

**mm** is the minutes (2-digit integer).

**x.m."** is a.m. or p.m.

# DBtime

---

## Other Things You Need to Know

The information for this section comes from the system clock. PDIF File Writer creates this section. It isn't required by PDIF File Reader.

---

## Example

```
{DBtime  "Jun. 17, 1992      7:20 p.m.  " }
```

# DBtype

(Database Type)

## Keyword

---

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Specifies the database type.

---

### What It Looks Like

```
{DBtype "type"}
```

where

**type** is Schematic if created in the Schematic Editor, PC-Board if created in the PCB Editor, Schematic Library if created in the Symbol Editor, or PC-Board Library if created in the Part Editor.

---

### Example

```
{DBtype "Schematic"}
{DBtype "PC-Board"}
{DBtype "Schematic Library"}
{DBtype "PC-Board Library"}
```

# DBunit

(Database Unit)

**Keyword**

---

## Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

## Where You Find It

ENVIRONMENT

---

## What It Does

Specifies the unit of measurement in which the database is measured.

---

## What It Looks Like

```
{DBunit "unit"}
```

where

**unit** is a unit of measurement.

---

## Other Things You Need to Know

In the P-CAD system, the DBU can be measured in mils, centimils, centimeters, or decimicrons. PDIF File Writer produces a value of MIL for mils or CMM for centimeters.

For more information, see the DBgrid keyword.

# DBunit

---

## Example

```
{DBunit "CENTIMIL" }
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	Environment! Change Units

# DBvrev

(Database Version/Revision)

**Keyword**

---

## Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

## Where You Find It

ENVIRONMENT

---

## What It Does

Shows the database version or revision number.

---

## What It Looks Like

`{DBvrev n.nn}`

where

**n.nn** is the revision number.

---

## Other Things You Need to Know

This keyword refers to the P-CAD database version number. It isn't user-changeable.

---

## Example

`{DBvrev 2.08}`

# DC

(Dimension-Circle)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DETAIL / ANNOTATE / DIMENSION

---

### What It Does

Specifies a circle for dimensioning.

---

### What It Looks Like

`{DC cx cy r}`

where

**cx** is the center x coordinate.

**cy** is the center y coordinate.

**r** is the radius.

---

### Other Things You Need to Know

A circle is identified by the center coordinates cx and cy, and the radius r.

---

### Example

`{DC 3500.00 2600.00 250.00 }`

---

**P-CAD Cross-Reference**

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Center All</i>
	<i>Dimension! Center All</i>



# Dcode

(Aperture Dcode)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

APERTURE\_TABLE

---

### What It Does

Specifies the Dcode of the aperture.

---

### What It Looks Like

```
{Dcode n}
```

where

**n** is an integer, from 10 to 1008.

---

### Other Things You Need to Know

Dcodes must be in the range of 10 to 1008. If the Dcode isn't within this range, PDIF will display an error message and won't create the aperture table.

---

### Example

```
{Dcode 15}
```

# Dcode

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Ddu

(Dimension Display Unit)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY

### What It Does

Specifies the current dimension display unit.

### What It Looks Like

```
[Ddu unit_id]
```

where

**unit\_id** is

0 for English

1 for Metric

2 for English[Metric]

3 for Metric[English]

### Example

```
[Ddu 1]
```

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Configure</i>

**DETAIL***Section*

---

**What It Does**

This section and the SYMBOL section are the major sections of the PDIF database. The DETAIL section consists of all data pertaining to the actual circuit, including all drawing/layout annotations, the electrical wiring or network, and the components and their connectivities.

The DETAIL section is organized into the major subsections shown in the format below.

The PAD\_STACK subsection is present only for PCB databases, as it contains information about PCB vias (feedthroughs) and padstacks, which do not exist in schematic databases.

---

**What It Looks Like**

```
{DETAIL
  {ANNOTATE           % may be absent
    . . .
  }
  {NET_DEF            % may be absent
    . . .
  }
  {PAD_STACK          % PCB and Part
    databases only
    . . .
  }
  {SUBCOMP
    . . .
  }
}
```

# DIMENSION

(Auto-dimension)

## Subsection

---

## Section It's Found In

DETAIL / ANNOTATE

---

## What It Does

The DIMENSION subsection describes automatic dimensioning features such as:

- Point-to-point dimension
- Datum dimension
- Leader dimension
- Angular dimension
- Circle or arc center
- Circle or arc diameter
- Circle or arc radius

Each dimension is constructed from the following elements or a combination of the following elements:

- Line
- Rectangle
- Circle
- Text
- Arrow
- Arc

# DIMENSION

## What It Looks Like

```
{DIMENSION "type"  
  { DL .....}  
  { DT .....}  
  { Arrow .....}  
  { DR .....}  
  { DC .....}  
  { DArc .....}  
}
```

where

**type** specifies the kind of dimension:

Point	point-to-point dimension
Datum_WL	datum dimension with line
Datum_NL	datum dimension without line
Leader	leader dimension
Center dimension	circle or arc center
Diameter dimension	circle or arc diameter
Radius dimension	circle or arc radius
Angle	angular dimension

## Keywords It Contains

Arrow	arrow type
DArc	dimension arc
DC	dimension circle
DL	dimension line
DR	dimension rectangle
DT	dimension text

# DIMENSION

---

## Example

```
{DIMENSION Datum_NL
{DL 220.00 3000.00 -942.36 3000.00 }
{DL -21.21 2728.79 -593.13 2156.87 }
{DArc 250.00 3000.00 -881.24 2841.01 -831.48 2632.06}
{Arrow XCA3}
{DArc 250.00 3000.00 -782.91 2512.06 -662.33 2312.51}
{Arrow XCA5}
{DT "45$$a" -944.18 2512.06}
```

# DISPLAY

*Section*

---

## What It Does

This section defines the beginning values for certain global parameters used throughout the PDIF file. The values specified in this section can be changed anywhere in the PDIF database. Once defined, a parameter value remains in effect until it is redefined.

PDIF File Writer always includes this section in the PDIF file it writes. You can omit this section from a PDIF file to be read by PDIF File Reader if the ENVIRONMENT section in the PDIF file specifies a file that contains the beginning parameters.

---

## What It Looks Like

```
{DISPLAY
  [Ly "layer"]
  [Ls "style"] [Wd n]
  [Ts n] [Tj "hv"] [Tr n] [Tm "m"]
  [Dwd n] [Dts m]
  [Afn "arrow"]
}
```

---

## Other Things You Need to Know

Each time PDIF File Writer begins a new section, it outputs the display status values even if the display status hasn't changed since the previous section. This facilitates editing the PDIF file by keeping track of the current status for you.



# DISPLAY

## Keywords It Contains

Ly	active layer
Ls	line style
Wd	line width
Ts	text size
Tj	text justification
Tr	text rotation angle
Tm	text mirror flag
Dwd	dimension line width
Dts	dimension text size
Daft	digit after decimal
Cent	center line size
Elf	extension line offset
Eba	extension beyond arrowhead
Dli	dimension line increment
Dtl	dimension tolerance
Dpt	dimension plus tolerance
Dmt	dimension minus tolerance
Dtd	dimension text direction
Dor	dimension orientation
Dlt	dimension leader type
Ds	dimension diameter symbol type
Lss	leader symbol size
Afn	arrowhead filename
Mas	minimum aperture size
Gdt	dimension type for grouping
Apt	angular dimension plus tolerance
Amt	angular dimension minus tolerance

# DISPLAY

---

## Example

```
{DISPLAY
  [Ly "DIMS"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 80.00][Tj "LB"][Tr 0][Tm "N"]
  [Dwd 0.00][Dts 120.00][Dafd 3]
  [Cent 62.00][Elf 30.00][Eba 50.00]
  [Dli 250.00][Dtl 0][Dpt 0.00][Dmt 15.00]
  [Dtd 0][Dor 0][Dlt 2][Lss 500.00][Ddt 1]
  [Gdt 277][Apt 0.01][Amt 0.01]
  [Afn "arrow.ah"]
  [Mas 5.00]
}
```

# DL

(Dimension-Line)

## Keyword

---

## Databases That Use It

PCB

---

## Where You Find It

DETAIL / ANNOTATE / DIMENSION

---

## What It Does

Specifies a line for dimensioning.

---

## What It Looks Like

```
{DL x1 y1 x2 y2 ... }
```

where

**x** is the x coordinate at the end of a segment.

**y** is the y coordinate at the end of a segment.

---

## Other Things You Need to Know

Each x y defines a line segment.

---

## Example

```
{DL 990.00 -250.00 1170.00 -250.00 }
```

---

**P-CAD Cross-Reference**

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Leader</i>
	<i>Dimension!Bind</i>

# Dli

(Dimension Line Increment)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DISPLAY, where required

---

### What It Does

Specifies the dimension line increment of auto-dimension features.

---

### What It Looks Like

`[Dli n]`  
where  
`n` is a real number.

---

### Example

`[Dli 250.00]`

---

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Dlt

(Dimension Leader Type)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the auto-dimension leader type.

---

## What It Looks Like

[Dlt n]

where

**n** is 0 for text, 1 for square, or 2 for circle.

---

## Example

[Dlt 0]

[Dlt 2]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Bind</i>

# Dmt

(Dimension Minus Tolerance)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

DISPLAY, where required

---

### What It Does

Specifies the auto-dimension minus tolerance.

---

### What It Looks Like

[Dmt n]

where

n is a real number in mils, from 0 to 1 inch.

---

### Example

[Dmt 5.00]

---

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Adjust</i> Minus ("): 0.00

# Dor

(Dimension Orientation)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the dimension orientation.

---

## What It Looks Like

[Dor n]

where

**n** is 0 for horizontal or 1 for vertical.

---

## Example

[Dor 1]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Dimension!Adjust ♦ Horiz (Vert)



# Dpt

(Dimension Plus Tolerance)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY, where required

### What It Does

Specifies the dimension plus tolerance.

### What It Looks Like

[Dpt n]

where

**n** is a real number in mils, 0 to 1 inch.

### Example

[Dpt 5.00]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Adjust</i> Plus (") : 0.000

# DR

(Dimension-Rectangle)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DETAIL / ANNOTATE / DIMENSION

---

## What It Does

Specifies a rectangle for dimensioning.

---

## What It Looks Like

{DR x1 y1 x2 y2}

where

**x** is the x coordinate.

**y** is the y coordinate.

---

## Other Things You Need to Know

A rectangle is identified by two opposite corner coordinate specifications, x1 y1 and x2 y2.

---

## Example

{DR 1650.00 3500.00 2150.00 4000.00 }

# DR

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Leader</i>
	<i>Dimension!Bind</i>

# Ds

(Diameter Symbol Type)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the diameter symbol type of a diameter dimension.

---

## What It Looks Like

[Ds n]

where

**n** is 0 for symbol or 1 for text.

---

## Example

[Ds 0]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Dimension!Configure

# DT

(Dimension-Text)

## Keyword

---

## Databases That Use It

PCB

---

## Where You Find It

DETAIL / ANNOTATE / DIMENSION

---

## What It Does

Specifies text and its location for dimensioning.

---

## What It Looks Like

```
{DT "string" x y}
```

where

**string** is the text.

**x** is the x coordinate.

**y** is the y coordinate.

---

## Other Things You Need to Know

DT specifies a dimension text string and its location in the PCB database. The text string can be up to 256 characters long. If the string doesn't fit in a single line, PDIF File Writer splits it across multiple lines.

---

## Example

```
{DT "4.700" 4760.00 -610.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Leader</i>
	<i>Dimension!Bind</i>

# Dtd

(Dimension Text Direction)

## Keyword

## Databases That Use It

PCB

## Where You Find It

DISPLAY, where required

## What It Does

Specifies the dimension text direction.

## What It Looks Like

[Dtd n]

where

n is 0 for horizontal, 1 for vertical

## Example

[Dtd 1]

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Adjust</i> ♦ THoriz (TVert)

# DtI

(Dimension Tolerance)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the dimension tolerance.

---

## What It Looks Like

[DtI n]

where

**n** is 0 for no tolerance, 1 for tolerance

---

## Example

[DtI 0]

---

## P-CAD Cross-Reference

<i>Editor</i>		<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension! Adjust</i>	ShwTol



# Dts

(Dimension Text Size)

## Keyword

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the auto-dimensioning text size.

---

## What It Looks Like

[Dts n]

where

n is a real number in mils, from 0.002 inch to 5.000 inches.

---

## Other Things You Need to Know

The autodimensioning text size specified in DISPLAY is the default for all text in the DIMENSION section. A new value can be specified anywhere in the DIMENSION section. When a new value is specified, that value becomes the default.

---

## Example

[Dts 120.00]

# Dts

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Dus

(Dimension Display Unit Symbol)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY

### What It Does

Specifies the current display unit symbol.

### What It Looks Like

[Dus sym]

where

**sym** is

1 to display the unit symbol

0 not to display the unit symbol.

The default is 0.

### Example

[Dus 0]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Dwd

(Dimension Line Width)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the auto-dimensioning line width.

---

## What It Looks Like

[Dwd n]

where

**n** is a real number in mils, from 0 to 0.255 inch.

---

## Other Things You Need to Know

The autodimensioning line width specified in DISPLAY is the default for all lines in the DIMENSION section. A new value can be specified anywhere in the DIMENSION section. When a new value is specified, that value becomes the default.

---

## Example

[Dwd 5.00]

# Dwd

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Eba

(Extension Beyond Arrowhead)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the extension beyond an arrowhead for auto-dimensioning.

---

## What It Looks Like

[Eba n]

where

**n** is a real number in mils, from 0 to 1 inch.

---

## Example

[Eba 125.00]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# Elf

(Extension Line Offset)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY, where required

### What It Does

Specifies the extension line offset for autodimensioning.

### What It Looks Like

[**Elf** n]

where

**n** is a real number in mils. from 0 to 1 inch.

### Example

[**Elf** 30.00]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Configure</i>

# ENVIRONMENT

## Section

### What It Does

This section describes the database environment used at the creation of the PDF file.

### What It Looks Like

The ENVIRONMENT section produced by PDF File Writer has the following format.

```
{ENVIRONMENT
  {PDFvrev n.nn }
  {Program "Pdifout Version n.nn"}
  {DBtype "type" }
  {DBvrev n.nn }
  {DBtime "time_stamp" }
  {DBunit "unit" }
  {DBgrid n }
  {Lyrstr "layer" color "layer" color .
  .
  {Lyrphid index tmpos physid ...}
  {Ssymtbl vtype vnature layer1 layer2
  .
  {Apr aper1 aper2 ...}
  {PCLR cl}
  {Polyap width}
  {PSIZ area}
}
```

A PDF file with an ENVIRONMENT section in the above format must include the DBtype and Lyrstr information; if it isn't present, PDF File Reader won't be able to process the file.

A user-created PDF file to be input to PDF File Reader can have the ENVIRONMENT format shown above, or it can have the alternate format shown below.

```
{ENVIRONMENT
  file
  {PDFvrev n.nn}
}
```

where

**file** is the name of a file that contains beginning environment settings; for example, a board outline or a layer structure file.



With either format, if the PDIFvrev keyword isn't present, PDIF File Reader assumes the current version.

# ENVIRONMENT

## Keywords It Contains

PDIFvrev	PDIF version number
Program	PDIF File Writer version used to create the file
DBtype	database type, schematic, symbol, symbol library, or PCB, part, or pc-board library.
DBvrev	source database version number
DBtime	database creation date and time
DBunit	database unit
DBgrid	database grid definition
Lyrstr	layer structure definition
Lyrphid	layer physical ID
Ssymtbl	special symbol table
Apr	list of apertures entered with the <i>Edit! Inner Plane Apertures</i> command
PCLR	polygon pouring/trace plowing clearance
Polyap	default polygon drawing aperture size
PSIZ	polygon minimum size

## Example

**Example 1** – Shows an ENVIRONMENT section produced by PDIF File Writer.

```
{ENVIRONMENT
{PDIFvrev 8.00}
{Program "PDIF-OUT Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994          9:58 a.m.          "}
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 5 "FLCOMP" 5 "PADSLD" 2 "FLSOLD" 8 "PADINT" 3
"FLINT" 9 "GNDCON" 10 "FLGCON" 6 "CLEAR" 12 "FLCLER" 12
"PWRCON" 13 "FLPCON" 12 "SLDMSK" 14 "FLSMSK" 14 "DRILL" 15
"FLDRLL" 15 "PIN" 5 "BRDOUT" 13 "FLTARG" 4 "SLKSCR" 14
"DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1 "SOLDER" 2 "INT1" 3
"INT2" 4 "DRLGIN" 6 "DRLFIN" 6 "PINTOP" 4 "PINBOT" 3
"MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
"BARCMP" 1 "BARSLD" 2 "BARALL" 3 "$CONT" 3 "BARVIA" 11
"$DRC" 6 "DRLDAT" 15 "FLIN1" 11 "PADIN1" 4 "PADI1" 11
"$ECO" 3 "ATTR2" 6 "PADIN2" 6 "PADIN3" 9 "PADIN4" 9
"TEMP" 15 "$$NULL" 0}
```

# ENVIRONMENT

```
{Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30
      29 126 31 32 126 32 31 126 33 34 126 34 33 126 35
      36 126 36 35 126 37 38 126 38 37 126 39 40 126 40
      39 126 41 42 126 42 41 126 43 44 126 44 43 126 46
      46 46 47 47 47 48 48 48 52 52 52}
{Ssymtbl 0 -1 126 126}
{PCLR 100.00}
{PSIZ 64.00}
{Polyap 0.00}
{ROTP 0.00}
}
```

**Example 2** – Shows the alternate format.

```
{ENVIRONMENT boardb.pcb}
```

# FI

(Flash)

## Keyword

---

### Databases That Use It

PCB  
Part  
Part Library

---

### Where You Find It

SYMBOL / PIC  
DETAIL / ANNOTATE  
DETAIL / PAD\_STACK / PAD\_DEF / PIC  
DETAIL / SUBCOMP / COMP\_DEF / PIC

---

### What It Does

Specifies the location, aperture number, and rotation for a flash.

---

### What It Looks Like

`{F1 x y a r}`

where

**x** is the x coordinate.  
**y** is the y coordinate.  
**a** is the aperture number, 1 to 999.  
**r** is the aperture rotation angle  
0 is no rotation  
1 is 90 degree rotation  
2 is 180 degree rotation  
3 is 270 degree rotation

---

### Other Things You Need to Know

FI specifies photoplotting requirements in a PCB database. Aperture values for Gerber photoplotters are 1 through 999.

## Example

```
{F1 -3900.00 6600.00 21 1}
{F1 9350.00 12025.00 21 3}
{F1 -3750.00 12025.00 21 0}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Draw! Flash</i>
Part Editor	<i>Draw! Flash</i>

# Fr

(Filled Rectangle)

## Keyword

### Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

### Where You Find It

SYMBOL / PIC  
 DETAIL / ANNOTATE  
 DETAIL / PAD\_STACK / PAD\_DEF / PIC  
 DETAIL / SUBCOMP / COMP\_DEF / PIC

### What It Does

Specifies a filled rectangle.

### What It Looks Like

{Fr x1 y1 x2 y2}

where

**x** is the x coordinate.

**y** is the y coordinate.

### Other Things You Need to Know

The rectangle is identified by two opposite corner coordinate specifications, x1 y1 and x2 y2.

# Fr

---

## Example

```
{Fr 9000.00 7700.00 9300.00 8000.00 }  
{Fr 9000.00 10100.00 9300.00 10400.00 }
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw!Filled Rectangle</i>

# Gdt

(Dimension Type for Group)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY, where required

### What It Does

Specifies the dimension type when using group commands.

### What It Looks Like

[Gdt n]

where

**n** is an integer.

### Example

[Gdt 277]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Dimension!Bind</i>

# Gs

(Grid Spacing)

**Keyword**

---

## Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

## Where You Find It

USER / VIEW

---

## What It Does

Specifies the grid spacing.

---

## What It Looks Like

$\{Gs \times y\}$

where

**x** is the x-axis spacing.

**y** is the y-axis spacing.

---

## Other Things You Need to Know

This keyword specifies the number of DBUs between visible grid points. The information is used by the P-CAD system only.



# Gs

---

## Example

```
{Gs 5.00 5.00}  
{Gs 25.00 25.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	Grd: 50:50

## Section It's Found In

DETAIL / SUBCOMP

## What It Does

The I subsection describes the unique properties of each instance of a component defined in COMP\_DEF, as well as the component-to-pin connections.

The I subsection has four major subsections, CN, IPT, ASG, and ATR, which are described separately.

## What It Looks Like

```
{I filename inv_name
  {CN
    . . .
  }
  {IPT                      % PCB database only
    . . .
  }
  {ASG                      % Schematic databases
    . . .
  }
  {ATR
    . . .
  }
}
```

where

**filename** is the name of the component, as used in COMP\_DEF.

**inv\_name** is the invocation name of the component. In the P-CAD system, this name is assigned using the *Name!Component* command in the Schematic or PCB Editor. If the component wasn't named in the PCB database, PDIF File Writer assigns a name in the format *XCnnnnn*, where *nnnnn* is a five-digit integer and is assigned sequentially starting with 00000. If the component wasn't named in the schematic database, PDIF File Writer assigns a name in the format *UNssssnnnn*, where *ssss* is the sheet identification and *nnnn* is the sheet number and is assigned sequentially starting with 0000. For an unnamed arrowhead

component, PDIF File Writer assigns a name in the format XCA $n$  where  $n$  is a sequentially assigned number starting with 0.

**Note:** PDIF File Writer doesn't generate an IPT subsection when there's no change in pin type. If there is a change but PDIF can't find the part file, it issues a warning message and doesn't generate an IPT subsection. Refer to the *Query!Pin* command in the *P-CAD Command Reference* for more information.

## Example

**Example 1** – Shows the I subsection for a schematic database.

```
{I 741s04.sym UC00000002
  {CN UN00000005 INP}
  {ATR
    {IN
      {Pl -430.00 110.00}
      {Ro 3}
    }
  }
}
```

**Example 2** – Shows the I subsection for a PCB database.

```
{I 741s00.prt U1
  {CN ? ? UN00000000 ? ? ? ? ? ? ? ? ? ?}
  {IPT 1 2 2 7 2 2 3 2 2 2 2 2 6}
  {ATR
    {IN
      {Pl 0.00 650.00}
    }
    {EX
      [Ly "ATTR"]
      [Ts 40.00][Tj "CB"][Tr 0][Tm "N"]
      {At FP DIP14 150.00 -650.00}
    }
  }
}
```

# lat

(P-CAD Internal Attribute)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Shows a P-CAD internal attribute.

---

## What It Looks Like

{Iat key value}

where

**key** is the attribute keyword.

**value** is the internal value.

---

## Other Things You Need to Know

The attribute keyword is a text string that defines the value. It can be up to eight characters long and must start with a letter.

The value is a text string of up to 39 characters. It begins with the first non-white-space character after `key', and ends with the last character before the closing `}'. The value is used internally by P-CAD for critical path information.

# Iat

## Example

```
{Iat $GRP CRTGROUP 1 }

{Iat $PTH
CRITPATH
SCH00008000 1 0 1
SCH00002000 }
```

## P-CAD Cross-Reference

Editor	View Layer Screen Option
Schematic Editor	Crit. Path!Add Group!Add
PCB Editor	Crit. Path!Add Group!Add

# Idia

(Aperture Inside Diameter)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the inside diameter of the hole in a round or square aperture.

---

## What It Looks Like

`{Idia n}`

where

**n** is a real number.

---

## Example

`{Idia 30.00}`

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# Iht

(Aperture Inside Height)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the inside height of the hole in a round, rectangular, or oval aperture.

### What It Looks Like

{Iht n}

where

**n** is a real number.

### Example

{Iht 20.00}

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# IPT

(Invocation Pin Type)

## Subsection

---

### Section It's Found In

DETAIL / SUBCOMP / I

---

### What It Does

This subsection specifies the invocation pin type for each pin of a part in a PCB database. This subsection is generated by PDIF File Writer when, as a result of the *Query!Pin* command in the PCB Editor, the pin type on a part is set to be different from that in the corresponding part file.

---

### What It Looks Like

When pin names are included in the PDIF file, the format is

```
{IPT pinname1 type1 pinname2 type2 ...}
```

Otherwise the format is

```
{IPT type1 type2 ...}
```

When an IPT subsection is used, it has an entry for each pin in the component. When pin names are included, PDIF File Reader matches pins to types by name. Otherwise, the matching is done by order.

---

### Example

```
{IPT 1 2 2 7 2 2 3 2 2 2 2 2 6}
```

IPT will be skipped if all pin types are the same as those in the PART (.prt) file.



# Iwd

(Aperture Inner Width)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the inside width of the hole in a rectangular aperture.

### What It Looks Like

`{Iwd n}`

where

**n** in a real number.

### Example

`{Iwd 50.00}`

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Jump

(Jumper)

Keyword

---

## Databases That Use It

PCB

Part

---

## Where You Find It

SYMBOL / ATR / IN

DETAIL / SUBCOMP / COMP\_DEF / ATR / IN

---

## What It Does

Defines a part as being a jumper.

---

## What It Looks Like

```
{Jump "F" }
```

where

F is Y for a jumper or N for a normal component.

---

## Other Things You Need to Know

PDIF File Writer doesn't generate this statement for normal components.

---

## Example

```
{Jump "Y" }
```

# Jmp

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Part Editor	<i>Enter!Jumper</i>

**L**

(Line)

**Keyword**

---

## Databases That Use It

Schematic	PCB
Symbol	Part
Symbol Library	Part Library

---

## Where You Find It

SYMBOL / PIC  
 DETAIL / ANNOTATE  
 DETAIL / PAD\_STACK / PAD\_DEF / PIC  
 DETAIL / SUBCOMP / COMP\_DEF / PIC

---

## What It Does

Specifies a line.

---

## What It Looks Like

`{L x1 y1 x2 y2 ... }`

where

**x** is the x coordinate at the end of a segment.

**y** is the y coordinate at the end of a segment.

---

## Other Things You Need to Know

Each x y defines a line segment.

# L

## Example

```
{L 3190.00 -100.00 3150.00 -100.00 }
{L 200.00 585.00 190.00 580.00 200.00 575.00 }
{L 200.00 575.00 190.00 580.00 200.00 585.00 }
{L 8900.00 7600.00 6735.00 7600.00 }
{L 5450.00 6225.00 5525.00 6200.00 }
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw\Line</i> ♦ wid: 0 ♦ Solid (Dashed, Dotted) ♦ Orth (Any, Diag)

# Lq

(Logical Equivalency Pin Code)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

SYMBOL / PIN\_DEF

DETAIL / SUBCOMP / COMP\_DEF / PIN\_DEF

---

## What It Does

Specifies logical equivalence of pins.

---

## What It Looks Like

$\{\underline{Lq} \ n\}$

where

**n** is the code number (integer).

---

## Other Things You Need to Know

The Lq code number shows which pins in the P list are logically equivalent. Pins that are logically equivalent (swappable) have the same non-zero code number; pins that are not logically equivalent (unswappable) have an Lq code of 0. PDIF File Writer uses the code numbers that were assigned by the database designer.

# Lq

## Example

```
{P RESET {Pt "OUTPUT"}{Lq 0}{Ploc 230.00 660.00}}
{P RES' {Pt "INPUT"}{Lq 0}{Ploc 0.00 660.00}}
{P IT2/IA0' {Pt "I/O"}{Lq 0}{Ploc 0.00 420.00}}
{P X2 {Pt "AN"}{Lq 0}{Ploc 0.00 0.00}}

{P 1 {Pt 1}{Lq 0}{Ploc 0.00 0.00}}
{P 2 {Pt 2}{Lq 0}{Ploc 0.00 -100.00}}
{P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
{P 20 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Pin Type</i>
Part Editor	<i>Enter!Pin</i>

# Ls

(Line Style)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the line style.

---

## What It Looks Like

```
[Ls "style"]
```

where

**style** is SOLID, DASHED, or DOTTED.

---

## Other Things You Need to Know

The DISPLAY section shows the default line style for all lines. A new line style can be specified anywhere in the PDIF file. When a new line style is specified, the new value becomes the default. The legal Ls values are SOLID, DASHED, and DOTTED.



# Ls

---

## Example

[Ls "SOLID"]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw!Line</i> ♦   Solid (Dotted, Dashed)

# Lss

(Leader Symbol Size)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DISPLAY, where required

---

## What It Does

Specifies the leader symbol size for auto-dimensioning.

---

## What It Looks Like

[Lss n]

where

**n** is a real number, from 0 to 3 inches.

---

## Example

[Lss 500.00]

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Dimension!Configure

# Lv

(Layer View Status)

## Keyword

### Databases That Use It

Schematic PCB

### Where You Find It

USER

### What It Does

Shows the active layer and the view status for each layer.

### What It Looks Like

`{Lv a s1 s2 s3 ... sn}`

where

**a** is the number of the active layer (defined by its position on the layer screen) (integer).

**s1** to **sn** show the layer viewing status for each layer:

- 0 = off
- 1 = on
- 2 = abl

### Other Things You Need to Know

Layers are listed in the order they appear on the layer screen. The layer viewing status information is used by the P-CAD system only.

Lv

Example

{Lv 9 2 0 2 1 0 2 2 2 2 0 0 1 2}

P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>View Layer</i>

# Ly

(Layer)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DISPLAY, where required

---

### What It Does

Specifies the active layer.

---

### What It Looks Like

```
[Ly "layer"]
```

where

**layer** is the layer name.

---

### Other Things You Need to Know

The layer specified in the DISPLAY section is the active layer, on which all data is placed. Another layer can be specified anywhere in the PDIF file. When another layer is specified, it becomes the new active layer.

Example

```
{DISPLAY
  [Ly "NETNAM" ]

{DETAIL
  {ANNOTATE
    [Ly "TEXT" ]

{NET_DEF
  {N UN002215
    {DG
      [Ly "WIRES" ]

{COMP_DEF 80188.sym
  {PIN_DEF
    [Ly "PINCON" ]
    {P RESET {Pt "OUTPUT"}{Lq 0}{Ploc 230.00 660.00}}
    {P RES' {Pt "INPUT"}{Lq 0}{Ploc 0.00 660.00}}
    {P IT2/IA0' {Pt "I/O"}{Lq 0}{Ploc 0.00 420.00}}
```

P-CAD Cross-Reference

Editor	View Layer Screen Option	
All Editors	View Layer	◆ GATE

# Lyrphid

(Layer Physical ID)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Defines layer physical identification.

---

### What It Looks Like

```
{Lyrphid index trnpos physid ... }
```

where

**index** is the layer index number.

**trnpos** is the transpose mapping number.

**physid** is the layer physical ID.

---

### Other Things You Need to Know

Lyrphid together with Ssymtbl handles blind and buried vias. For each layer in the database, there is a set of three numbers. These sets are given in the same order as the layer names under the Lyrphid keyword.

In each set, the first number is the index to some layer. The second number is the index to some layer to which the data on this layer would be moved when a part is transposed from the top side of the board to the bottom side.

# Lyrphid

For a trace layer, the third number is the same as the first number.  
For a non-trace layer, the third number is 126.

## Example

```
{Lyrstr "PADCOM" 7 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9
"FLINT" 9 "GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12
"PWRCON" 13 "FLPCON" 13 "SLDMSK" 14 "FLSMSK" 14 "DRILL" 15
"FLDRLL" 15 "PIN" 4 "BRDOUT" 14 "FLTARG" 4 "SLKSCR" 6
"DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1 "SOLDER" 2 "INT1" 14
"INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4 "PINBOT" 3
"MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
"PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5
"DVCTOP" 1 "DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "DIMS" 15
"FABDAT" 10 "$$NULL" 0}
{Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30 29
126 31 32 126 32 31 126 33 34 126 34 33 126 35 36 126 36 35
126 37 38 126 38 37 126 39 40 126 40 39 126 41 42 126 42 41
126 43 44 126 44 43 126}
{Ssymtbl 0 -1 126 126}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Environment! Assign Layer Pairs



# Lyrstr

(Layer Structure)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Defines the layer structure.

---

### What It Looks Like

```
{Lyrstr "layer" n "layer" n ... }
```

where

**layer** is a layer name.

**n** is the color code for the corresponding layer (integer).

---

### Other Things You Need to Know

This specification includes all the layers that were defined when the database was created.

# Lyrstr

**Note:** The special layer name \$\$NULL is generated by PDIF File Writer and accepted by PDIF File Reader to handle data properly on a special hidden layer. Avoid using this name for normal visible layers because of its special meaning to PDIF. It will not appear in the layer table of databases produced by PDIF File Reader.

---

## Example

```
{Lyrstr "WIRES" 1 "BUS" 2 "GATE" 3 "PINNUM" 10 "PINNAM" 4 "PINCON" 6
  "REFDES" 8 "ATTR" 10 "SDOT" 1 "DEVICE" 5 "ATTR2" 5 "NOTES" 5
  "NETNAM" 5 "BORDER" 1 "IEEE" 2 "TEXT" 6 "PINFUN" 3 "$$NULL" 0}
}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>View Layer</i>

# Mas

(Minimum Aperture Size)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DISPLAY, where required

### What It Does

Specifies the minimum aperture size.

### What It Looks Like

[Mas n]

where

**n** is a real number.

### Example

[Mas 5.00]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Set Minimum Aperture</i>

# MEM\_TABLE

*(Library Table)***Section**

---

**Section It's Found In**

Symbol Library

Part Library

---

**What It Does**

Shows the library member information table.

---

**What It Looks Like**

```
{MEM_TABLE
  { Lteid Memid Member Device Type }
}
```

where

**Lteid** is the numerical order in the database of the primary component.**Memid** is the index number in the member table if the component is the primary; if the component is an alias, it is the numerical order number of its primary component.**Member** is the member symbol or part name.**Device** is the text name that appears on the DEVICE layer.**Type** is 0 if the component is primary or 1 if the component is aliased.

---

**Example**

```
{MEM_TABLE
{ 0 1 7220.sym 7220 0 }
{ 1 2 8031ah.sym 8031AH 0 }
{ 2 3 8031ahp.sym 8031AH 0 }
.
.
.
```

# MEM\_TABLE

```
{ 53 54 82c55a.sym 82C55A 0 }  
{ 54 55 82c55ap.sym 82C55A 0 }  
{ 55 0 7224.sym 7224 1 }  
{ 56 1 8032ah.sym 8032AH 1 }  
.  
.  
.  
{ 62 1 8751h.sym 8751H 1 }  
{ 63 2 8032ahp.sym 8032AHP 1 }  
{ 64 2 8051ahp.sym 8051AHP 1 }  
{ 65 2 8052ahp.sym 8052AHP 1 }
```

# Mode

(Database Editing Mode)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

USER / VIEW

---

## What It Does

Specifies the database editing mode.

---

## What It Looks Like

{Mode mode}

where

**mode** is the editing mode, either SYMB for the Symbol and Part Editors, or DETL for the Schematic and PCB Editors.

---

## Other Things You Need to Know

If this keyword isn't present in a PDIF file, PDIF File Reader sets the current mode to SYMB if the database has a symbol view with or without a detail view, or DETL if the database has a detail view but no symbol view.

# Mode

---

## Example

```
{Mode SYMB}  
{Mode DETL}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Environment! Symbol Mode</i>
Symbol Editor	<i>Environment! Detail Mode</i>

**Mr**

(Mirror)

**Keyword**

---

## Databases That Use It

Schematic

---

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Specifies whether or not the mirroring function is in use in a schematic.

---

## What It Looks Like

`{Mr "m" }`

where

**m** is Y if mirror-image is active, or N if orientation is normal.

---

## Other Things You Need to Know

This attribute refers to the y-axis orientation of components in the database. It is produced by PDIF File Writer for component instance only if mirroring is specified. It isn't required for PDIF File Reader if the component isn't mirrored. This keyword applies only in a schematic database. The Ps keyword is used in a PCB database.

If a component has been both rotated and mirrored, PDIF File Reader will mirror the component first, then rotate it, regardless of the order in which rotation and mirroring occur in the PDIF file.

---

## Example

`{Mr "Y" }`



# Mr

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>	
Schematic Editor	<i>Enter! Component</i>	Mirror
Symbol Editor		

**N**

(Net)

**Subsection****Section It's Found In**

DETAIL / NET\_DEF

**What It Does**

Each N subsection completely describes one signal.

The DG subsection consists of the pictorial data, including locations for signal names.

The ATR subsection tells whether the net is local or global.

**What It Looks Like**

```
{N net_name
  {DG
    {W x1 y1 x2 y2 . . . }
    {W x1 y1 x2 y2 . . . }
    . . .
    {V x y viatype}
    {V x y viatype}
    {Poly
      {Ol type x1 y1 x2 y2 ...}
      {Pv x1 y1 x2 y2 ...}
      {Cv xc yc r}
    }
  }
  . . .
  {Nn x y x y . . . }
}
{ATR
  {IN
    {Ns s}
  }
}
```

# N

## Keywords It Contains

Arc	arc
W	wire segment or sequence of wire segments
V	via locations for PCB databases, or solder dot locations for schematic databases
Nn	locations for net names to be displayed
Ns	global net
Poly	polygon
Polyap	polygon aperture size
OI	outline
Pv	polygonal void
Cv	circular void
Nn	net name location
Ns	net scope
Rats	ratsnest status
Un	user-assigned name

## Example

**Example 1** – Shows the NET\_DEF subsection for a schematic.

```
{NET_DEF
  {N UN00002215
    {DG
      [Ly "WIRES"]
      [Ls "SOLID"][Wd 0.00]
      [Ts 20.00][Tj "CC"][Tr 0][Tm "N"]
      {V 700.00 340.00 15}
      {W 570.00 340.00 700.00 340.00 780.00 340.00 }
      {W 700.00 340.00 700.00 350.00 }
    }
  }
  {N A18
    {DG
      [Ly "WIRES"]
      [Ls "SOLID"][Wd 0.00][Ts 20.00][Tj "CC"][Tr 0][Tm "N"]
      {W 1660.00 1310.00 1600.00 1310.00 1580.00 1290.00 }
      {W 960.00 280.00 1000.00 280.00 1020.00 260.00 }
    }
  }
}
```

**Example 2** – Shows the NET\_DEF subsection for a PCB design.

```
{NET_DEF
{N PCA0
{DG
[Ly "INT2"]
[Ls "SOLID"][Wd 10.00]
[Ts 80.00][Tj "CC"][Tr 0][Tm "N"]
{W 5700.00 7400.00 5600.00 7300.00 5600.00 7200.00 }
}
```

# Nat

(Net attribute)

## Keyword

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DETAIL / NET\_DEF / N / ATR / EX

---

## What It Does

Specifies net attributes in the net record.

---

## What It Looks Like

{Nat keyword value}

where

**keyword** is the keyword of the net attribute.

**value** is the value of the net attribute.

# Nat

---

## Example

```
{Nat WIDTH 12}  
{Nat LAYER COMP}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Edit! Net Attr</i>
PCB Editor	<i>Edit! Net Attr</i>

# NET\_DEF

(Net Definition)

## Subsection

---

## Section It's Found In

DETAIL

---

## What It Does

NET\_DEF describes the circuit wiring diagram, including wire graphics, signal names, and attributes.

The NET\_DEF subsection consists of a series of N subsections, one for each signal in the database. The N subsection is described separately.

---

## What It Looks Like

```
{NET_DEF
  {N net_name
    . . .
  }
  {N net_name
    . . .
  }
  . . .
}
```

where

**net\_name** is the name of the net, entered in the P-CAD system using the *Name!Net* command in the Schematic and PCB Editors.

# NET\_DEF

## Example

```
{NET_DEF
{N UN00000007
{DG
  [Ly "WIRES"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "LB"][Tr 0][Tm "N"]
  {W -80.00 190.00 360.00 190.00 }
}
}
{N UN00000001
{DG
  [Ly "WIRES"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "LB"][Tr 0][Tm "N"]
  {W -90.00 -50.00 350.00 -50.00 }
}
}
```



# NI

(Name Location)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

### What It Does

Specifies the location of the component instance name.

---

### What It Looks Like

$\{\underline{N1} \ x \ y\}$

where

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

NI specifies the location of the name of a specific instance of a component if the name is displayed. The location given is relative to the component origin after any scaling, mirroring, or rotation. The name of the component instance is given in the I section.

---

## Example

{N1 100.00 175.00}

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Name! Component</i>
PCB Editor	<i>Name! Component</i>

# Nn

(Net Name)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DETAIL / NET\_DEF / N / DG

---

### What It Does

Specifies the location of the net name.

---

### What It Looks Like

```
{Nn x y x y ... }
```

where

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

Nn specifies one or more locations for the name of the net identified in the N subsection. A net name can be displayed at more than one location.

---

### Example

```
{Nn 1600.00 1320.00}
{Nn 970.00 290.00}
```

# Nn

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Name! Net</i>
PCB Editor	<i>Enter! Wire</i>

# Ns

(Net Scope)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DETAIL / NET\_DEF / N / ATR / IN

---

### What It Does

Specifies the net scope.

---

### What It Looks Like

`{Ns s}`

where

**s** is 0 for a local net or 1 for a global net.

---

### Other Things You Need to Know

The Ns keyword is required only for global nets. If a net is local, PDIF File Writer doesn't generate the Ns keyword. If PDIF File Reader doesn't find the Ns keyword for a net, it assumes the net is local.

---

### Example

`{Ns 1}`

# Ns

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter! Global Net</i>
PCB Editor	<i>Enter! Global Net</i>

# Odia

(Aperture Outside Diameter)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the outside diameter of a round, target, thermal, or special-shaped aperture.

### What It Looks Like

{Odia n}

where

**n** is a real number.

### Example

{Odia 80.00}

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# Oht

(Aperture Outside Height)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the height of an oval, rectangular, or special-shaped aperture.

---

## What It Looks Like

{Oht n}

where

**n** is a real number.

---

## Example

{Oht 50.00}

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>



# OI

(Outline)

## Keyword

---

### Databases That Use It

PCB

Part

---

### Where You Find It

SYMBOL / PIC / POLY

DETAIL / ANNOTATE / POLY

DETAIL / NET\_DEF / N / DG / POLY

DETAIL / PAD\_STACK / PIC / POLY

DETAIL / SUBCOMP / COMP\_DEF / PIC / POLY

---

### What It Does

Specifies the outline of a polygon.

---

### What It Looks Like

```
{OI type x1 y1 x2 y2 ... }
```

where

**type** is the polygon fill type, 1 for solid fill, and 2 for hatched.

**xn** is an x coordinate.

**yn** is a y coordinate.

---

### Other Things You Need to Know

If you're using PDIF to recreate a database that was created using a system other than P-CAD, you must enter the polygon outline coordinates in a clockwise direction.

## Example

```
{O1 1 -103128.67 62829.31 -104271.33 62829.31 -104650.00
62450.64
-104650.00 64800.00 -101300.00 64800.00 -101300.00 55750.00
-104650.00 55750.00 -104650.00 60449.36 -104271.33 60070.69
-103128.67 60070.69 -102320.69 60878.67 -102320.69 62021.33 }
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
<i>PCB Editor</i>	<i>Draw!Polygon</i>
	<i>Enter!Polygon</i>
<i>Part Editor</i>	<i>Draw!Polygon</i>

# Org

(Origin)

## Keyword

---

### Databases That Use It

Symbol

Part

---

### Where You Find It

SYMBOL / ATR / IN

DETAIL / PAD\_STACK / PAD\_DEF / ATR / IN

---

### What It Does

Specifies the location of the component origin.

---

### What It Looks Like

$\{\underline{\text{Org}} \ x \ y\}$

where

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

The origin is the reference point for the placement of a symbol in the database. Placement of an instance is given by PI.

# Org

---

## Example

```
{Org -21474836.47 -21474836.47}  
{Org -21474836.47 -21474836.47}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Origin</i>
Part Editor	<i>Enter!Origin</i>

# Owd

(Aperture Outside Width)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the outside width of an oval, rectangular, special shape, or square aperture.

### What It Looks Like

{Owd n}

where

**n** is a real number.

### Example

{Owd 100.00}

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# Pa

(Placement Angle)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Specifies the placement angle.

---

## What It Looks Like

{Pa d }

where

**d** is the placement angle. This angle is an integer from 1 to 89 degrees inclusive.

---

## Other Things You Need to Know

PDIF File Reader combines the placement angle with the rotation (Ro keyword) in determining how to orient a component.

---

## Example

{Pa 34}

# Pa

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>	
Schematic Editor	<i>Enter!Component</i>	Angle : 0
	<i>Rotate!Object</i>	Angle : 0
PCB Editor	<i>Enter!Component</i>	Angle : 0
	<i>Rotate!!Object</i>	Angle : 0

# Pad

(Pad or Via)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DETAIL / PAD\_STACK

---

## What It Does

Defines a pad or via.

---

## What It Looks Like

PDIF File Writer always uses the Pad keyword in the format shown below:

```
{Pad type "name" "name" }
```

where

**type** is the pin type, 0 for through-hole vias, 51 to 100 for blind, buried, or through-hole vias.

The first **name** is the file used for pads for pins connected to nets.

The second **name** is the file used for pads for unconnected pins.

PDIF File Reader also recognizes an alternate format that can be used when the same padstack file is used for both connected and unconnected pads:

```
{Pad type "name" }
```

where

**name** is the file used for pads for both connected and unconnected pins.



# Pad

## Other Things You Need to Know

The type is used in other subsections of the DETAIL section to specify the via or padstack file named with this keyword.

This keyword is specified in the special symbol file.

## Example

```
{Pad 0 "v50r28.ps"}
{Pad 1 "c60s32.ps" "n60s32.ps"}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Attach Padstacks</i>

# PAD\_STACK

## Subsection

### Section It's Found In

DETAIL

### What It Does

The PAD\_STACK subsection describes all the pads and vias (feedthroughs) in a PCB database. This subsection is used with PCB databases only.

The PAD\_STACK subsection includes one PAD\_DEF subsection for each type of pad or via used in the database. The PAD\_DEF subsection is also described below.

Each PAD\_DEF subsection has two subsections, PIC, which defines the graphic information, and ATR, which defines attributes. This data includes the pictorial representation of the pad or via and any attributes, and can contain data for photoplotting, drill tapes, and other manufacturing-related information.

The PIC and ATR subsections are also used in the SYMBOL section. Refer to the descriptions of the SYMBOL subsections for further information.

For PDIF File Writer to generate pad information, the input PCB database file must be linked to the padstacks. (The padstacks are linked by using the *Environment! Attach Cust. Sold. Dots* command in the PCB Editor.)

### What It Looks Like

```
{PAD_STACK
  {Pad type "name1" "name2"}
  {Pad type "name1" "name2"}
  {PAD_DEF name
    {ATR
      . . .
    }
    {PIC
      . . .
    }
  }
}
```

# PAD\_STACK

where

**type** is the number that defines a pad and is in the range of 1 through 50. A via uses a similar construct, except that there is only one name in the Pad statement, and the pad type is 0 or 51 to 63.

---

## Keywords It Contains

Pad – Identifies a pad or via

---

## Example

```
{PAD_STACK
  {Pad 0 "50v25.ps"}
  {Pad 1 "60s32c.ps"}
  {Pad 2 "60r32c.ps"}
  {Pad 3 "60r32g.ps"}
  {Pad 4 "60r32p.ps"}
  {Pad 5 "80r42c.ps"}
  {Pad 6 "50r32g.ps"}
  {Pad 7 "50r32p.ps"}
  {Pad 8 "50v25.ps"}
  {Pad 50 "25v13.ps"}
  {Pad 51 "25v1351.ps"}
  {Pad 52 "25v1352.ps"}
  {Pad 53 "25v1353.ps"}
  {Pad 54 "25v1354.ps"}
  {PAD_DEF 50v25.ps
    {ATR
      {IN
        {Org 0.00 0.00}
        {Ty 255}
      }
    }
  }
  {PIC
    [Ly "PADCOM"]
    [Ls "SOLID"][Wd 25.00]
    [Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
    {C 0.00 0.00 12.00 }
    [Ly "FLCOMP"]
    {Fl 0.00 0.00 12}
    [Ly "PADSLD"]
    {C 0.00 0.00 12.00 }
    [Ly "FLSOLD"]
    {Fl 0.00 0.00 12}
    [Ly "PADINT"]
    {C 0.00 0.00 12.00 }
    [Ly "FLINT"]
    {Fl 0.00 0.00 12}
    [Ly "GNDCON"]
    [Wd 35.00]
    {C 0.00 0.00 17.00 }
```

# PAD\_STACK

```
[Ly "FLGCON"]
{Fl 0.00 0.00 11}
[Ly "PWRCON"]
{C 0.00 0.00 17.00 }
[Ly "FLPCON"]
{Fl 0.00 0.00 11}
[Ly "SLDMSK"]
{C 0.00 0.00 17.00 }
[Ly "FLSMSK"]
{Fl 0.00 0.00 11}
[Ly "DRILL"]
[Wd 0.00]
{L -15.00 5.00 -15.00 15.00 -5.00 15.00 }
{L -5.00 -15.00 -15.00 -15.00 -15.00 -5.00 }
{L 15.00 -5.00 15.00 -15.00 5.00 -15.00 }
{L 5.00 15.00 15.00 15.00 15.00 5.00 }
{L 0.00 20.00 -20.00 0.00 0.00 -20.00 20.00 0.00
0.00 20.00 }
}
}
```

# PCLR

(Polygon Pouring/Trace Plowing Clearance)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Specifies the program setting of trace to polygon clearance during polygon pouring or trace plowing operations.

---

### What It Looks Like

```
{PCLR cl}
```

where

**cl** is the clearance value. This value is set with the *Environment! Polygon Wire Clearance* command in the PCB Editor. Its range is 1 to 500 DBUs.

---

### Example

```
{PCLR 0.00}  
{PCLR 100.00}
```

# PCLR

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Polygon Wire Clearance</i>

# PDFvrev

(PDF Version/Revision)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Shows the PDF version/revision number.

---

### What It Looks Like

`{PDFvrev n.nn}`

where

**n.nn** is the version number (three digits).

---

### Other Things You Need to Know

PDFvrev specifies the version number of the PDF file format, which is changed occasionally. (This version number is separate from PDF File Reader and PDF File Writer program version numbers.) PDF File Reader uses the PDFvrev number to determine each PDF file's format, and then processes the file accordingly.

# PDFvrev

PDF File Writer automatically inserts the correct PDFvrev number in each PDF file it creates. If you create a PDF file manually or through a custom program, the correct PDFvrev number should be included. Otherwise, PDF File Reader assumes that the current revision of PDF is being used.

---

## Example

```
{PDFvrev 4.00}
```



# Pfc

(Polygon Flash Clearance)

## Keyword

### Databases That Use It

Part  
PCB

### Where You Find It

DISPLAY

### What It Does

Specifies the polygon flash clearance.

### What It Looks Like

[Pfc n]

where

**n** is a real number in the range of 1 to 500 mils.

### Example

[Pfc 10.00]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Environment!Polygon Flash Clearance

# PIC

*(Picture)***Subsection**

---

**Section It's Found In**

SYMBOL

DETAIL / PAD\_STACK / PAD\_DEF

DETAIL / SUBCOMP / COMP\_DEF

---

**What It Does**

The PIC subsection includes all graphical data that makes up the symbol or part. This data usually includes the symbol or part graphics and annotation texts.

---

**What It Looks Like**

```

{PIC
  {T "string" x y}
  {L x1 y1 x2 y2 x3 y3 . . . }
  {R x1 y1 x2 y2}
  {Fr x1 y1 x2 y2}
  {A cx cy r sa ea}
  {C cx cy r}
  {Fl x y a}
  {Poly
    {Polyap width}
    {Ol type x1 y1 x2 y2 ...}
    {Pv x1 y1 x2 y2 ...}
    {Cv xc yc r}
  }
  {Pv x1 y1 x2 y2 ...}
  {Cv xc yc r}
}
PIC

```

# PIC

## Keywords It Contains

T	text string
L	line segments
R	rectangle
Fr	filled rectangle
Arc	arc
C	circle
Fl	flash (for photoplotter graphics)
Poly	polygon
Polyap	polygon aperture size
OI	outline
Pv	polygonal void
Cv	circular void

Polygons and voids apply only to a PCB database. Within the Poly subsection there must be exactly one outline. There can be any number of polygonal voids and circular voids (holes) in this subsection and therefore associated with the polygon.

The PIC subsection can also have any number of polygonal voids and circular voids *not* inside a Poly subsection. These voids are not associated with any particular polygon.

## Example

**Example 1** – Describes the picture and accompanying text for a 74ls00 symbol.

```
{PIC
  [Ly "GATE"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "RC"][Tr 0][Tm "N"]
  {L 110.00 80.00 50.00 80.00 50.00 0.00 110.00 0.00 }
  {Arc 110.00 40.00 110.00 0.00 110.00 80.00}
  {C 160.00 40.00 10.00 }
  {L 170.00 40.00 185.00 40.00 }
  {L 10.00 20.00 50.00 20.00 }
  {L 10.00 60.00 50.00 60.00 }
  {L 10.00 20.00 0.00 20.00 }
  {L 0.00 60.00 10.00 60.00 }
  {L 185.00 40.00 200.00 40.00 }
  [Ly "IEEE"]
}
```

## PIC

```

{L 170.00 40.00 200.00 40.00 }
{L 170.00 50.00 185.00 40.00 }
{L 0.00 20.00 30.00 20.00 }
{L 0.00 60.00 30.00 60.00 }
{R 30.00 0.00 170.00 80.00 }
[Ly "PINFUN"]
[Tj "CC"]
{T "&" 95.00 70.00}
[Ly "DEVICE"]
{T "74LS00" 100.00 -10.00}
}

```

**Example 2** – Shows the picture and text that describe a 7400 part.

```

{PIC
  [Ly "SLKSCR"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 40.00][Tj "CB"][Tr 0][Tm "N"]
  {L 100.00 700.00 150.00 650.00 200.00 700.00 }
  {L 50.00 700.00 50.00 0.00 250.00 0.00 250.00 700.00 50.00 700.00 }
  [Ly "DEVICE"]
  [Ts 125.00][Tj "CC"][Tr 3]
  {T "7400" 150.00 350.00}
}

```

# Pid

(Symbol Packaging ID)

## Keyword

---

### Databases That Use It

Symbol	Part
Symbol Library	Part Library

---

### Where You Find It

SYMBOL / PKG  
 DETAIL / SUBCOMP / COMP\_DEF / PKG  
 DETAIL / SUBCOMP / I / ASG

---

### What It Does

Specifies symbol packaging ID.

---

### What It Looks Like

```
{Pid partname}
```

where

**Pid** is the packaging ID.

**partname** is the packaging part name of this symbol.

---

### Other Things You Need to Know

The symbol packaging ID links nonhomogeneous symbols. Different layer names can be assigned for packaging alphanumeric pin numbers. The maximum string name size is two characters.

# Pid

---

## Example

{Pid 8031AH}

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Packaging Data</i>
Part Editor	<i>Enter!Packaging Data</i>

# PIN\_DEF

(Pin Definition)

## Subsection

### Section It's Found In

SYMBOL  
DETAIL / SUBCOMP / COMP\_DEF

### What It Does

The PIN\_DEF subsection defines the pins in the component. It consists of one P subsection for each pin. Each P subsection gives the name and type of the pin, its logical equivalency, and its location. Pin ordering for the component is the same as the order of the P subsections.

### What It Looks Like

```
{PIN_DEF
  {P pinname {Pt "type"}{Lq n}{Ploc x
  y}}
  {P pinname {Pt "type"}{Lq n}{Ploc x
  y}}
  . . .
}
```

where

**pinname** is the name of the pin (entered in the P-CAD system using the *Enter!Pin* command in the Symbol and Part Editors).

### Keywords It Contains

Pt	pin type
Lq	logical equivalency group
Ploc	pin location coordinates in DBUs

# PIN\_DEF

**Note:** When used in the SYMBOL section, pin locations are relative to the database origin (as is the symbol location, given by SYMBOL / ATTR / IN / ORG).

When used in the DETAIL / SUBCOMP / COMP\_DEF section, pin locations are relative to the component origin (set with the *Enter!Origin* command in the Symbol and Part Editors).

## Example

**Example 1** – Shows the PIN\_DEF subsection for a schematic library symbol database.

```
{PIN_DEF
  [Ly "PINCON"]
  {P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 200.00 40.00}}
  {P INA {Pt "INPUT"}{Lq 1}{Ploc 0.00 60.00}}
  {P INB {Pt "INPUT"}{Lq 1}{Ploc 0.00 20.00}}
}
```

**Example 2** – Shows the PIN\_DEF subsection for a physical part database corresponding to the symbol in Example 1.

```
{PIN_DEF
  [Ly "PIN"]
  {P 1 {Pt 1}{Lq 1}{Ploc 0.00 650.00}}
  {P 2 {Pt 2}{Lq 1}{Ploc 0.00 550.00}}
  {P 3 {Pt 2}{Lq 0}{Ploc 0.00 450.00}}
  {P 4 {Pt 2}{Lq 2}{Ploc 0.00 350.00}}
  {P 5 {Pt 2}{Lq 2}{Ploc 0.00 250.00}}
  {P 6 {Pt 2}{Lq 0}{Ploc 0.00 150.00}}
  {P 7 {Pt 3}{Lq 0}{Ploc 0.00 50.00}}
  {P 8 {Pt 2}{Lq 0}{Ploc 300.00 50.00}}
  {P 9 {Pt 2}{Lq 3}{Ploc 300.00 150.00}}
  {P 10 {Pt 2}{Lq 3}{Ploc 300.00 250.00}}
  {P 11 {Pt 2}{Lq 0}{Ploc 300.00 350.00}}
  {P 12 {Pt 2}{Lq 4}{Ploc 300.00 450.00}}
  {P 13 {Pt 2}{Lq 4}{Ploc 300.00 550.00}}
  {P 14 {Pt 4}{Lq 0}{Ploc 300.00 650.00}}
}
```



# PKG

(Packaging)

## Subsection

---

### Section It's Found In

SYMBOL  
DETAIL / SUBCOMP / COMP\_DEF

---

### What It Does

The PKG subsection is used only with schematic databases and defines packaging information for a schematic symbol. The definition consists of locations where the reference designator and the pin numbers will be shown when the symbol is placed on a schematic and the logic gates are mapped to physical package sections.

**Note:** A pin number can be numeric or alphanumeric.

---

### What It Looks Like

```
{PKG
  {Rd1 x y}
  {Pn1 x y}
  {Pn1 x y}
  {Pid name} (schematic and symbol
databases only)
  {Sd s an1 an2 an3 . . . }
  {Sd s an1 an2 an3 . . . }
  . . .
}
```

---

### Keywords It Contains

Rd1	location for displaying the reference designator
Pn1	locations for displaying the pin numbers
Sd	package section and pin numbers
Pid	packaging ID (symbol databases only)

## PKG

---

Other Things You Need to Know

Pnl subsections must be in the same order as the associated P subsections for the component.

---

Example

```
{PKG
  [Ly "REFDES"]
  [Ts 25.00][Tj "CB"][Tr 0][Tm "N"]
  {Rdl 115.00 700.00}      [Ly "PINNUM"]
  [Ts 15.00][Tj "LC"]
  {Pnl 210.00 670.00}
  [Tj "RC"]
  {Pnl 20.00 670.00}
  {Pid 80188}
  {Sd A 57 51 22 23 56 25 27 28 29 30 31 32 33 34 38 37 36 35 61
63 62 39 48 40 52 53 54 68 67 66 65 64 24 50 20 21 49 55 47 18
19 45 44 42 41 46 17 15 13 11 8 6 4 2 16 14 12 10 7 5 3 1 59
58}
}
```

# PI

(Place)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

### What It Does

Specifies the location of a component.

---

### What It Looks Like

$\{\underline{P1} \times y\}$

where

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

PI specifies the location for the origin point of a component in the database. It is produced by PDIF File Writer for all databases with DETAIL data. It isn't required for PDIF File Reader. If PDIF File Reader doesn't find a PI value for a component, it places the component at 0 0.

## Example

```
{ATR
{IN
{P1 540.00 1360.00}
{Mr "Y" }
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter!Component</i>
PCB Editor	<i>Enter!Component</i>

# Ploc

(Pin Location)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

SYMBOL / PIN\_DEF / P

DETAIL / SUBCOMP / COMP\_DEF / PIN\_DEF / P

---

### What It Does

Specifies the location of a pin.

---

### What It Looks Like

{Ploc x y}

where

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

For the DETAIL section, Ploc specifies the location of a given pin relative to the origin of a component (as set by *Enter! Origin* in the Symbol and Part Editors).

For the SYMBOL section, Ploc specifies the actual location of the pins in the database.

# Ploc

## Example

```
{PIN_DEF
  [Ly "PINCON"]
  {P RESET {Pt "OUTPUT"}{Lq 0}{Ploc 230.00 660.00}}
  {P RES' {Pt "INPUT"}{Lq 0}{Ploc 0.00 660.00}}
  {P IT2/IA0' {Pt "I/O"}{Lq 0}{Ploc 0.00 420.00}}
  {P X2 {Pt "AN"}{Lq 0}{Ploc 0.00 0.00}}
```

```
{PIN_DEF
  [Ly "PIN"]
  {P 1 {Pt 1}{Lq 0}{Ploc 0.00 0.00}}
  {P 2 {Pt 2}{Lq 0}{Ploc 0.00 -100.00}}
  {P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
  {P 20 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Pin</i>
Part Editor	<i>Enter!Pin</i>

# Pn

(Pin Number)

## Keyword

---

## Databases That Use It

Schematic

---

## Where You Find It

DETAIL / SUBCOMP / I / ASG

---

## What It Does

Specifies a pin number and its location.

---

## What It Looks Like

$\{\underline{Pn} \text{ "an" } x \ y\}$

where

**an** is the pin number.

**x** is the x coordinate.

**y** is the y coordinate.

---

## Other Things You Need to Know

Pn specifies a pin number, an, and defines its preassigned location in a schematic database. This pin number can be alphanumeric or numeric. The location given is relative to the component origin and includes any scaling, mirroring, or rotation.

**Pn**

---

**Example**

{Pn "57" 210.00 670.00}

---

**P-CAD Cross-Reference**

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter!Ref. Des. &amp; Section</i>



# Pnl

(Pin Number Location)

## Keyword

---

### Databases That Use It

Symbol  
Symbol Library

---

### Where You Find It

SYMBOL / PIN\_DEF / PKG  
DETAIL / SUBCOMP / COMP\_DEF / PIN\_DEF / PKG

---

### What It Does

Specifies the location of the package pin number.

---

### What It Looks Like

$\{\underline{\text{Pnl}} \ x \ y\}$   
where  
 $x$  is the x coordinate.  
 $y$  is the y coordinate.

---

### Other Things You Need to Know

Pnl is a packaging specification for a schematic symbol. It gives the location where a package pin number is displayed when the symbol is used on a schematic. The PDIF file contains a Pnl specification for each pin of the symbol. The order of Pnl sections is the same as the order of P sections for the component type.

# Pnl

---

## Example

```
{Pnl 210.00 670.00}  
{Pnl 20.00 670.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Packaging Data</i>

# Poly

(Polygon)

## Keyword

---

### Databases That Use It

PCB

Part

---

### Where You Find It

SYMBOL / PIC

DETAIL / ANNOTATE

DETAIL / NET\_DEF / N / DG

DETAIL / PAD\_STACK / PIC

DETAIL / SUBCOMP / COMP\_DEF / PIC

---

### What It Does

Specifies a polygon. The polygon can be connective (a wire) or graphical only. A polygon has an aperture size (Polyap) and an outline (ol), and may have associated polygonal voids (Pv) and circular voids (Cv). These are described in separate sections.

---

### What It Looks Like

```
{Poly
  {Polyap width}
  {ol type x1 y1 x2 y2 ...}
  {Pv x1 y1 x2 y2 ...}
  {Cv xc yc r}
}
```

---

### Other Things You Need to Know

If you're using PDIF to recreate a database that was created using a system other than P-CAD, you must enter the polygon outline coordinates in a clockwise direction.

---

### Example

```
{Poly
  {Polyap 8.00}
```

# Poly

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Draw!Polygon</i>
	<i>Enter!Polygon</i>
Part Editor	<i>Draw!Polygon</i>

# Polyap

(Polygon Aperture Size)

## Keyword

---

### Databases That Use It

PCB

---

### Where You Find It

ENVIRONMENT

SYMBOL / PIC

DETAIL / ANNOTATE

DETAIL / NET\_DEF / N / DG

DETAIL / PAD\_STACK / PAD\_DEF / PIC

DETAIL / SUBCOMP / COMP\_DEF / PIC

---

### What It Does

Specifies the polygon drawing aperture size.

In the ENVIRONMENT section it means the global default aperture width for drawing or entering polygons.

In a Poly section it means the aperture for that particular polygon. It should appear before the ol subsection of a Poly section.

---

### What It Looks Like

```
{Polyap width}
```

where

**width** is the polygon drawing aperture width, which can range from 0 to 250.

# Polyap

---

## Example

{Polyap 8.00}

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Enter!Polygon</i>

# Program

(Database Creation Program)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

ENVIRONMENT

---

### What It Does

Shows the PDIF File Writer version used to create the database.

---

### What It Looks Like

```
{Program "Pdifout Version n.n"}
```

where

**n.n** is the PDIF File Writer version number.

---

### Example

```
{Program "Pdifout Version 8.5"}
```

# Ps

(Placement Side)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Specifies the placement side for a part.

---

## What It Looks Like

```
{ Ps "S" }
```

where

**S** is T for the top side (component side) of the board and B for the bottom side (solder side) of the board.

---

## Other Things You Need to Know

PDIF File Writer generates this statement only for parts placed on the bottom side of the boards.

---

## Example

```
{Ps "B" }
```



# Ps

## P-CAD Cross-Reference

<i>Editor</i>		<i>View Layer Screen Option</i>
PCB Editor	<i>Enter!Component</i>	◆ Bottom (Top)

# PSIZ

(Polygon Minimum Size)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

ENVIRONMENT

---

## What It Does

Specifies the minimum polygon area size.

---

## What It Looks Like

```
{ PSIZ area }
```

where

**area** is a real number area that can range from 0 to 32000.

---

## Example

```
{PSIZ 64.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	Environment! Min. Polygon Size

# Pt

(Pin Type Definition)

## Keyword

---

### Databases That Use It

Schematic

Part

---

### Where You Find It

SYMBOL / PIN\_DEF / P

DETAIL / SUBCOMP / COMP\_DEF / PIN\_DEF / P

---

### What It Does

Defines the pin type.

---

### What It Looks Like

For a schematic database, the format is

{Pt "type" }

where

**type** is INPUT, OUTPUT, I/O, OC, OE, TRI, AN, 7, 8, 9, 10, 11, 12, 13, 14, or 15.

## Pt

For a PCB database, the format is

```
{Pt n}
```

where

**n** is the pin type, 1 to 50 (integer) or 101 to 255.

Code	Used for
0	Through-hole via (not used in parts)
1-24	Through-hole pin types
25-50	SMD pin types
51-99	Interstitial and through-hole vias
100-1000	User-assigned pin types

## Example

**Example 1** – Defines the pins for a schematic symbol.

```
{COMP_DEF 741s00.sym
{PIN_DEF
  [Ly "PINCON"]
  {P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 200.00 20.00}}
  {P INA {Pt "INPUT"}{Lq 1}{Ploc 0.00 40.00}}
  {P INB {Pt "INPUT"}{Lq 1}{Ploc 0.00 0.00}}
}
```

**Example 2** – Defines the pins for a PCB part.

```
{COMP_DEF 7400A.PRT
{PIN_DEF
  [Ly "PIN"]
  {P 1 {Pt 1}{Lq 1}{Ploc 0 0}}
  {P 2 {Pt 2}{Lq 1}{Ploc 0 -100}}
  {P 3 {Pt 2}{Lq 0}{Ploc 0 -200}}
  {P 4 {Pt 2}{Lq 2}{Ploc 0 -300}}
  {P 5 {Pt 2}{Lq 2}{Ploc 0 -400}}
  {P 6 {Pt 2}{Lq 0}{Ploc 0 -500}}
  {P 7 {Pt 3}{Lq 0}{Ploc 0 -600}}
  {P 8 {Pt 2}{Lq 0}{Ploc 300 -600}}
  {P 9 {Pt 2}{Lq 3}{Ploc 300 -500}}
  {P 10 {Pt 2}{Lq 3}{Ploc 300 -400}}
  {P 11 {Pt 2}{Lq 0}{Ploc 300 -300}}
  {P 12 {Pt 2}{Lq 4}{Ploc 300 -200}}
  {P 13 {Pt 2}{Lq 4}{Ploc 300 -100}}
  {P 14 {Pt 4}{Lq 0}{Ploc 300 0}}
}
```

# Pt

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Pin Type</i>
Part Editor	<i>Enter!Pin Type</i>

**Pv**

(Polygonal Void)

**Keyword**

---

## Databases That Use It

PCB  
Part

---

## Where You Find It

SYMBOL / PIC  
SYMBOL / PIC / Poly  
DETAIL / ANNOTATE  
DETAIL / ANNOTATE / Poly  
DETAIL / NET\_DEF / N / DG / Poly  
DETAIL / PAD\_STACK / PIC  
DETAIL / PAD\_STACK / PIC / Poly  
DETAIL / SUBCOMP / COMP\_DEF / PIC  
DETAIL / SUBCOMP / COMP\_DEF / PIC / Poly

---

## What It Does

Specifies a polygonal void. A void in a Poly subsection is associated with that polygon. Any other void isn't associated with a polygon.

---

## What It Looks Like

```
{Pv x1 y1 x2 y2 . . . }
```

where

**xn,yn** is a coordinate pair of the polygonal void.

---

## Example

```
{Pv 381.00 127.00 381.00 -254.00 190.50 -254.00 190.50 127.00 }
```

# Pv

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Draw!Polygonal Void</i>
Part Editor	<i>Draw!Polygonal Void</i>

# R

(Rectangle)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

SYMBOL / PIC

DETAIL / ANNOTATE

DETAIL / PAD\_STACK / PAD\_DEF / PIC

DETAIL / SUBCOMP / COMP\_DEF / PIC

---

## What It Does

Specifies a rectangle.

---

## What It Looks Like

{R x1 y1 x2 y2}

where

**x** is the x coordinate.

**y** is the y coordinate.

---

## Other Things You Need to Know

A rectangle is identified by two opposite corner coordinate specifications, x1 y1 and x2 y2.



# R

## Example

```
{R 9075.00 7750.00 9275.00 7950.00 }  
{R 9050.00 10150.00 9275.00 10350.00 }  
{R 50.00 -650.00 250.00 50.00 }
```

## P-CAD Cross-Reference

Editor	View Layer Screen Option
All Editors	<i>Draw!Rectangle</i> ♦ Solid (Dashed, Dotted)  Wid: 0

# Rats

(Ratsnest Status)

## Keyword

### Databases That Use It

PCB

### Where You Find It

DETAIL / NET\_DEF / N / ATR / IN

### What It Does

Reports the ratsnest status for the net.

### What It Looks Like

```
{Rats "VAL" }
```

where

**VAL** indicates the ratsnest status as ON, OFF, or DIS (disabled).  
 PDIF File Writer doesn't generate this keyword if the status is ON.

### Example

```
{Rats "DIS" }
```

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Ratsnest

# RCTL

(Ratsnest Display Status)

## Keyword

### Databases That Use It

PCB

### Where You Find It

USER / VIEW

### What It Does

Specifies the ratsnest display status.

### What It Looks Like

```
{RCTL s1 s2 s3}
```

where

**s1**, **s2**, and **s3** are three integers that represent the ratsnest display status.

### Example

```
{RCTL 0 0 0}
{RCTL 0 20 0}
```

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Display! Control Ratsnest</i>

# Rd

(Reference Designator)

**Keyword**

---

## Databases That Use It

Schematic

---

## Where You Find It

DETAIL / SUBCOMP / I / ASG

---

## What It Does

Specifies the reference designator and its location.

---

## What It Looks Like

```
{Rd "rd" x y}
```

where

**rd** is the reference designator.

**x** is the x coordinate.

**y** is the y coordinate.

---

## Other Things You Need to Know

The location given is relative to the component origin after any scaling, mirroring, and rotation.

---

## Example

```
{Rd "U9" 108.00 661.00}
```

# Rd

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter! Ref. Des. &amp; Section</i>

# Rdl

(Reference Designator Location)

**Keyword**

---

## Databases That Use It

Schematic  
Symbol  
Symbol Library

---

## Where You Find It

SYMBOL / PKG  
DETAIL / SUBCOMP / COMP\_DEF / PKG

---

## What It Does

Specifies the reference designator location.

---

## What It Looks Like

$\{\text{Rdl} \times y\}$   
where  
 $x$  is the x coordinate.  
 $y$  is the y coordinate.

---

## Other Things You Need to Know

In a schematic symbol database, Rdl specifies where the reference designator will be displayed when the symbol is used in a design database.

# Rdl

---

## Example

```
{Rdl 115.00 700.00}  
{Rdl 115.00 450.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Packaging Data</i>
Schematic Editor	<i>Enter!Packaging Data</i>

# RIs

(Reference Layer)

**Keyword**

---

## Databases That Use It

Schematic  
Symbol

PCB  
Part

---

## Where You Find It

DISPLAY

---

## What It Does

Indicates whether layers set to ON are reference (read-only) layers or not.

---

## What It Looks Like

{RIs n}

where

**n** is 0 or 1:

0 = OFF, meaning the ON layers are not reference layers.

1 = ON, meaning the ON layers are reference layers.

---

## Other Things You Need to Know

If the RIs keyword has any value other than 0 or 1, the system displays one of two warning messages, but continues its process. The messages are

Integer is out of boundary

or

Invalid numerical value<string>



# RIs

---

## Example

```
{RIs 1}  
{RIs 0}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	ON=ReadOnly
PCB Editor	ON=ReadOnly

# Ro

(Rotation)

**Keyword**

## Databases That Use It

Schematic	PCB
Symbol	Part

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

## What It Does

Specifies the rotation of a component.

## What It Looks Like

{Ro n}

where

**n** is 0 to 3:

0 = no rotation

1 = 90 degrees

2 = 180 degrees

3 = 270 degrees

## Other Things You Need to Know

Ro is produced by PDIF File Writer for a component instance only if rotation is specified. It's not required by PDIF File Reader for nonrotated components.

PDIF File Reader combines the placement angle (Pa keyword) with the rotation in determining how to orient a component.

Rotation is counterclockwise in the database.

If a component has been both rotated and mirrored, PDIF File Reader will mirror the component first, then rotate it, regardless of the order in which rotation and mirroring occur in the PDIF file.

# Ro

---

## Example

{Ro 2}

---

## P-CAD Cross-Reference

<i>Editor</i>		<i>View Layer Screen Option</i>	
Schematic Editor	0 Deg	(90, 180, 270)	
PCB Editor	0 Deg	(90, 180, 270)	

# ROTP

(Rotate Padstacks)

**Keyword**

---

## Databases That Use It

PCB  
Part  
Part Library

---

## Where You Find It

ENVIRONMENT

---

## What It Does

Specifies whether or not padstacks rotate when components rotate.

---

## What It Looks Like

```
{ROTP flag}
```

where

**flag** is 0 when padstacks don't rotate, and 1 when they do rotate.

---

## Example

```
{ROTP 0.00}  
{ROTP 0.01}
```

# Sc

(Scale)

## Keyword

---

### Databases That Use It

Schematic

---

### Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

### What It Does

Shows the scale at which a component symbol is entered in a design database.

---

### What It Looks Like

{Sc sc st}

where

**sc st** is the percentage of the original component and text size.

**sc** is the component scale (real number from 1 to 10000).

**st** is the text scale (real number from 1 to 10000).

---

### Other Things You Need to Know

Text and components are scaled equally x and y. For example,

`Sc 100 50`

means scale the component 100% and the text 50%x and 50%y.

This attribute is produced by PDIF File Writer for a component instance only if the scale isn't 100 100. It isn't required for PDIF File Reader if the scale is 100 100.

# Sc

---

## Example

{Sc 50 50}

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter!Component</i>

# Sd

(Section Definition)

## Keyword

---

### Databases That Use It

Schematic  
Symbol  
Symbol Library

---

### Where You Find It

SYMBOL / PKG  
DETAIL / SUBCOMP / COMP\_DEF / PKG

---

### What It Does

Defines the logical-to-physical mapping of a schematic symbol, by section.

---

### What It Looks Like

```
{Sd s an1 an2 an3 ... }
```

where

**s** is the package section.

**an1, an2, ...** are alphanumeric pin numbers.

---

### Other Things You Need to Know

The PDIF file contains an Sd specification for each package section, s, into which the symbol can be mapped. Each package pin number, an, corresponds to a pin of the schematic symbol.

# Sd

Pins are listed in the order in which they are defined in the PIN\_DEF / P section for the schematic symbol. For example, if a symbol has three pins, and the P section for the pin named INA is listed first, the P section for INB second, and the P section for OUTY third, then in each Sd specification, n1 corresponds to INA, n2 to INB, and n3 to OUTY.

## Example

```
{Sd A 3 1 2}
{Sd B 6 4 5}
{Sd C 8 9 10}
{Sd D 11 12 13}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter! Packaging Data</i>



# Shp

(Aperture Shape)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the aperture shape.

### What It Looks Like

```
{Shp shape}
```

where

**shape** is either Rectangle, Round, Oval, Polygon, Square, Target, Thermal, or a macro filename that contains a thermal shape description.

### Example

```
{Shp OVAL}
```

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# Sides

(Aperture Sides)

**Keyword**

---

## Databases That Use It

PCB

---

## Where You Find It

APERTURE\_TABLE

---

## What It Does

Specifies the number of sides in a special-shaped aperture and their coordinates.

---

## What It Looks Like

```
{Sides n x1,y1 ... xn, yn}
```

where

**n** is the number of sides, from 3 to 10.

**x1,y1 ... xn,yn** are the coordinates of each vertex in the special shape.

---

## Other Things You Need to Know

The number of sides in a special-shaped aperture must be in the range of 3 to 10. If the number of sides is outside this range, PDIF will display an error message, and won't create the aperture table.

---

## Example

```
{Sides 6 0.00 10.00 20.00 20.00 20.00 -20.00 0.00 -30.00 -  
20.00 -20.00 -20.00 20.00}
```

# Sides

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment! Edit Aperture Table</i>
Part Editor	<i>Environment! Edit Aperture Table</i>

# Smd

(Surface-Mount Device)

**Keyword**

---

## Databases That Use It

PCB  
Part

---

## Where You Find It

SYMBOL / ATR / IN  
DETAIL / SUBCOMP / COMP\_DEF / ATR / IN

---

## What It Does

Defines a part as a surface-mount device.

---

## What It Looks Like

```
{ Smd "F" }
```

where

**F** is Y for a surface-mount part, or N for a through-hole part.

---

## Other Things You Need to Know

PDIF File Writer doesn't generate this statement for through-hole parts.

---

## Example

```
{ Smd "Y" }
```

# Smd

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Part Editor	<i>Enter!Component Type</i>

# Sna

(Section Name)

Keyword

---

## Databases That Use It

Part

---

## Where You Find It

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Specifies the section name for each gate type.

---

## What It Looks Like

```
{Sna sectnam1 sectnam2 ... sectnamn}
```

where

**Sna** is the section name for a gate type.

**sectnam $n$**  is the section name, up to two characters.

---

## Other Things You Need to Know

Sna must be given before each Sp for each gate type.

---

## Example

```
{Sna A B C D}
```

# Sna

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Part Editor	<i>Enter! Packaging Data</i>

# Sp

(Symbol Pin Map)

**Keyword**

---

## Databases That Use It

PCB  
Part  
Part Library

---

## Where You Find It

SYMBOL / SPKG  
DETAIL / SUBCOMP / COMP\_DEF / SPKG

---

## What It Does

Shows the gate pin-to-packaged-part mapping.

---

## What It Looks Like

```
{Sp spn n1 n2 n3 ... }
```

where

**spn** is the symbol pin name.

**n** is a package pin number (integer).

---

## Other Things You Need to Know

This keyword specifies the pins in the packaged parts that parallel the pins in the corresponding schematic symbol.



# Sp

---

## Example

```
{Sp INA 1 4 9 12}  
{Sp INB 2 5 10 13}  
{Sp OUTY 3 6 8 11}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Part Editor	<i>Enter! Packaging Data</i>

# SPKG

## Subsection

### Section It's Found In

SYMBOL  
DETAIL / SUBCOMP / COMP\_DEF

### What It Does

SPKG contains the gate name mapping information for packaged parts. This subsection is present only for PCB databases.

### What It Looks Like

```
{SPKG
  {Sna name1 name2 . . . } (PCB and part
databases only)
  {Sp spn n1 n2 n3 . . . }
  {Apn a1 a2 . . . }
  . . .
}
```

### Keywords It Contains

Sna	Section name (part databases only)
Sp	Symbol pin mapping (numeric only)
Apn	alphanumeric pin number

### Example

```
{SPKG
  {Sp INA 1 4 9 12}
  {Sp INB 2 5 10 13}
  {SPKG
    {Sp OUTY 3 6 8 11}
  }
  {SP INA 1 4 9 12}
  {SP INB 2 5 10 13}
  {SP OUTY 3 6 8 11}
```

```

      {Apn A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10
A11 A12 A13}
}

```

# SSTfile

(Special Symbol Table Filename)

## Keyword

### Databases That Use It

PCB

Part

### Where You Find It

ENVIRONMENT

### What It Does

Specifies the special symbol table filename.

### What It Looks Like

```
{SSTfile filename}
```

where

**filename** is the name of a special symbol table file.

### Example

```
{SSTfile flshtst.ssf}
```

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	Environment! Attach Padstacks

# Ssymtbl

(Special Symbol Table)

Keyword

---

## Databases That Use It

PCB

---

## Where You Find It

ENVIRONMENT

---

## What It Does

Specifies the special symbol table.

---

## What It Looks Like

```
{Ssymtbl vtype, vnature, layer1, layer2  
... }
```

where

**vtype** is the via type.

**vnature** is the via nature. A value of -1 represents a through-hole via, while a value of -2 represents an interstitial via.

**layer1** is the first layer with this via type.

**layer2** is the second layer with this via type. When **vnature** is -1, **layer1** and **layer2** will be 126 (dummy entries).

---

## Other Things You Need to Know

Pin and via type ranges are		
Through-hole (fixed)		0
Pin types		1-50
Vias (blind/buried/through-hole)		51-100

Pin types 101-255

# Ssymtbl

## Example

```
{Lyrstr "PADCOM" 7 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9
  "FLINT" 9 "GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12
  "PWRCON" 13 "FLPCON" 13 "SLDMSK" 14 "FLSMSK" 14 "DRILL" 15
  "FLDRLL" 15 "PIN" 4 "BRDOUT" 14 "FLTARG" 4 "SLKSCR" 6
  "DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1 "SOLDER" 2 "INT1" 14
  "INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4 "PINBOT" 3
  "MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
  "PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5
  "DVCTOP" 1 "DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "DIMS" 15
  "FABDAT" 10 "$$NULL" 0}
{Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30 29
  126 31 32 126 32 31 126 33 34 126 34 33 126 35 36 126 36 35
  12637 38 126 38 37 126 39 40 126 40 39 126 41 42 126 42 41
  126 43 44 126 44 43 126}
{Ssymtbl 0 -1 126 126}
```

## P-CAD Cross-Reference

Editor	View Layer Screen Option
PCB Editor	Environment! Assign Layer Pairs

# SUBCOMP

*(Component Subsection)***Subsection**

---

**Section It's Found In**

DETAIL

---

**What It Does**

The SUBCOMP subsection defines the components used in the design. It specifies the parts used, their instance names, their pins and the pin connections to the signals defined in the NET\_DEF subsection.

The SUBCOMP subsection is organized into the subsections shown in the What It Looks Like section below. Each subsection is described separately, and examples are shown with the descriptions of the subsections.

In the PDIF file for a schematic or physical component, only the SUBCOMP heading is present and none of the subsections are used.

---

**What It Looks Like**

In the PDIF file produced by PDIF File Writer, the SUBCOMP subsection contains the definition of a component followed by all its instances, followed by the definition of the next component, and so forth, as shown below.

```
{SUBCOMP
  {COMP_DEF filename      % Component
  definition
    . . .
  }
  {I filename inv_name    % Each
  instance
    . . .
  }
  {I filename inv_name    % Next
  instance
    . . .
  }
  {COMP_DEF filename      % Define next
  component
```

```

    } . . .
  } . . .
}

```

## SUBCOMP

where

**filename** is the name of the component file.

**inv\_name** is the invocation name of the component instance (assigned in the P-CAD system using the *Enter!Name!Component* command in the Schematic and PCB Editors).

PDIF File Reader also recognizes an alternate format, useful with some CAD systems in which it's more convenient to list all the definitions first, and all the instances afterward, as shown below. The instances can be in any order.

```

{SUBCOMP
  {COMP_DEF filename          % Component
  definition
    . . .
  }
  {COMP_DEF filename          % Next
  component definition
    . . .
  }
  {I filename inv_name        % Instances
  . . .
  {I filename inv_name
  . . .
  {I filename inv_name
  . . .
  }
  . . .
}

```

# SYMBOL

## Section

### What It Does

This section and the DETAIL section are the major sections of the PDIF database. The SYMBOL section consists of information pertaining to the component, including pin definitions, packaging information, and graphics.

The SYMBOL section is organized into the major subsections shown in the format below. Each subsection is described separately and examples are shown with the descriptions of the subsections.

The PIN\_DEF and PIC subsections are empty when the database has no SYMBOL data, as with a top-level schematic database or a PCB design.

The PKG subsection specifies packaging information for a logic symbol, and therefore is present only for schematic symbol databases and packagable subcircuits.

The SPKG subsection specifies gate-pin names for PCB parts, and therefore is present only for PCB part databases.

The SYMBOL section isn't required when importing a netlist into PDIF File Reader. (See Appendix A, "Netlist Import.")

### What It Looks Like

```
{SYMBOL
  {PIN_DEF
    . . .
  }
  {PKG          % Schematic and symbol
databases only
    . . .
  }
  {SPKG         % PCB and part databases
only
    . . .
  }
  {PIC
    . . .
  }
  {ATR
    . . .
  }
}
```



# T

(Text)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

SYMBOL / PIC

DETAIL / ANNOTATE

DETAIL / PAD\_STACK / PAD\_DEF / PIC

DETAIL / SUBCOMP / COMP\_DEF / PIC

---

### What It Does

Specifies text and its location.

---

### What It Looks Like

```
{T "string" x y}
```

where

**string** is the text.

**x** is the x coordinate.

**y** is the y coordinate.

---

### Other Things You Need to Know

T specifies a text string and its location in the schematic or PCB database. The text string can be up to 256 characters long. If the string doesn't fit in a single line, PDFI File Writer splits it across multiple lines.

# T

---

## Example

```
{T "8" -30.00 1510.00}  
{T "DT/R" 190.00 170.00}  
{T "SOLDERMASK" -325.00 6575.00}  
{T "HT245" 150.00 -450.00}
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw! Text</i>

# Ta

(Tie Angle)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

APERTURE\_TABLE

---

### What It Does

Specifies the starting angle for the first tie in a thermal shape.

---

### What It Looks Like

[Ta n]

where

n is an angle between -360 degrees and +360 degrees.

---

### Other Things You Need to Know

The tie angle represents the angle from the X -axis to the first tie in the thermal shape. The angle is measured in one degree increments, where 0 degrees lies on the positive X -axis in a Cartesian coordinate system.

Positive angles are measured in a counterclockwise manner.

The ties are equally spaced and radiate from the center of the thermal.

---

### Example

[Ta 45]

# Ta

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

# Ti

(Number of Ties)

## Keyword

### Databases That Use It

Schematic

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the number of thermal ties in a thermal shape.

### What It Looks Like

[**Ti** n]

where

**n** is an integer between 1 and 10, inclusive.

### Example

[**Ti** 4]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

**Tj**

(Text justification)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DISPLAY

---

## What It Does

Specifies the text justification.

---

## What It Looks Like

[Tj "hv" ]

where

**hv** is a two-letter string in quotation marks.

where

**h** is horizontal justification: L, C, or R.

**v** is vertical justification: T, B, or C.

# Tm

(Text Mirroring)

## Keyword

### Databases That Use It

Schematic

PCB

### Where You Find It

DISPLAY

### What It Does

Shows whether text mirroring is in use.

### What It Looks Like

[ Tm "m" ]

where

m is Y if text mirroring is active or N if text orientation is normal.

### Other Things You Need to Know

The default Tm value specified in DISPLAY is normally N for all text. If Y is subsequently specified in the database, then Y becomes the default.

### Example

[ Tm "N" ]

Tm

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>	
Schematic Editor	<i>Draw!Text</i>	Mirror
PCB Editor	<i>Draw!Text</i>	Mirror



# Tr

(Text Rotation)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DISPLAY

---

### What It Does

Specifies the text rotation.

---

### What It Looks Like

[Tr n]

where

n is 0 to 3:

0 = no rotation

1 = 90 degrees

2 = 180 degrees

3 = 270 degrees

---

### Other Things You Need to Know

The default value shown in DISPLAY is normally 0 for all text. A different value can be specified anywhere in the PDIF file. When a different value is specified, then that value becomes the default.

Rotation is counterclockwise in the database.

See the Ro keyword.

# Tr

---

## Example

```
[Tr 1]  
[Tr 3]  
[Tr 0]
```

---

## P-CAD Cross-Reference

<i>Editor</i>		<i>View Layer Screen Option</i>	
All Editors	<i>Draw! Text</i>	0 Deg	(90, 180, 270)

# Ts

(Text Size)

## Keyword

---

### Databases That Use It

Schematic

PCB

---

### Where You Find It

DISPLAY, where required

---

### What It Does

Specifies the text size.

---

### What It Looks Like

[Ts n]

where

n is a positive number, 2 to 5000.

---

### Other Things You Need to Know

Ts specifies the height of the text in database units. The Ts value shown in DISPLAY is the default value for all text. A new value can be specified anywhere in the PDIF file. When a new value is specified, the new value becomes the default.

# Ts

---

## Example

```
[Ts 15.00]  
[Ts 0.01]  
[Ts 25.00]
```

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Draw!Text</i> Size: 35

# Twɔ

(Tie Width)

## Keyword

### Databases That Use It

PCB

### Where You Find It

APERTURE\_TABLE

### What It Does

Specifies the width of a thermal tie in a thermal shape description.

### What It Looks Like

[Twɔ n ]

where

**n** is the distance in DBU's.

### Example

[Twɔ 20.00]

### P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
PCB Editor	<i>Environment!Edit Aperture Table</i>
Part Editor	<i>Environment!Edit Aperture Table</i>

**Ty**

(Type)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

SYMBOL / ATR / IN

DETAIL / SUBCOMP / COMP\_DEF / ATR / IN

DETAIL / PAD\_STACK / PAD\_DEF / ATR / IN

---

## What It Does

Shows the component type.

---

## What It Looks Like

{Ty n}

where

**n** is an integer, -32000 to 32000.

---

## Other Things You Need to Know

The component type has several uses in the P-CAD system. The Schematic, Symbol, PCB, and Part Editors set a default value, which you can change if needed. Refer to the *Schematic Tools*, *PCB Tools*, and *Library Manager* manuals.

# Ty

---

**Example**

```
{Ty 255}  
{Ty 10000}
```

---

**P-CAD Cross-Reference**

<i>Editor</i>	<i>View Layer Screen Option</i>
Symbol Editor	<i>Enter!Component Type</i>
Part Editor	<i>Enter!Component Type</i>

# Un

(User-Assigned Name)

**Keyword**

---

## Databases That Use It

Schematic

---

## Where You Find It

DETAIL / NET\_DEF / N / ATR / IN

DETAIL / SUBCOMP / I / ATR / IN

---

## What It Does

Specifies a user-assigned net or component name.

---

## What It Looks Like

{ Un "VAL" }

where

**VAL** is Y for a user-assigned name, or N for a system-assigned name. PDIF File Writer doesn't generate this keyword for a system-assigned name.

---

## Example

{ Un "Y" }



# Un

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter! Component</i>
	<i>Enter! Wire</i>
	<i>Name! Component</i>
	<i>Name! Net</i>

# USER

Section

## Section It's Found In

## What It Does

This section includes system-specific data in one or more subsections.

The VIEW subsection contains information that is used only by the P-CAD system. It's always generated by PDIF File Writer.

The <system> subsection, where <system> is the name of another CAE/CAD/CAM system, contains information used only by that system. This subsection isn't generated by PDIF File Writer and isn't recognized by PDIF File Reader; it exists only to enable you to manually enter information necessary for the other system. The <system> subsection can have as many user-defined subsections and keywords as needed for the relevant data. A PDIF file can contain more than one <system> subsection if necessary.

## What It Looks Like

```
{USER
  {VIEW
    {Mode mode}
    {Vw ix iy is n llx lly urx ury n llx
lly urx ury . . . }
    {Lv a s1 s2 s3 . . . }
    {Gs x y}
    {RCTL s1 s2 s3}
    {
      <system>
      {key . . . }
      {sec . . . }
      {key . . . }
      . . .
    }
    . . .
  }
}
```

where

**key** is a user-defined keyword.

**sec** is the name of a user-defined subsection.

# USER

---

## Keywords It Contains

Mode	database editing mode
Vw	viewing windows
Lv	layer view status
Gs	grid spacing
RCTL	ratsnest display status

---

## Example

```
{USER
{VIEW
{Mode DETL}
{Vw 1500.00 495.00 4.00 1 -327.00 -1017.00 3327.00 2007.00
4 2318.00 1041.00 3212.00 1779.00
10 -204.00 -981.00 3204.00 1971.00}
{Lv 13 2 2 1 1 1 1 2 2 1 1 0 1 2 2 0 2 0}
{Gs 5.00 5.00}
}
```

**V**

(Via)

**Keyword**

---

## Databases That Use It

Schematic  
PCB

---

## Where You Find It

DETAIL / NET\_DEF / N / DG

---

## What It Does

Specifies the location of a solder dot in a schematic database or a via in a PCB database.

---

## What It Looks Like

{V x y type}

where

**x** is the x coordinate.

**y** is the y coordinate.

**type** is the type of solder dot or via (integer).

---

## Example

```
{V 700.00 340.00 15}  
{V 6050.00 7600.00 0}
```

# V

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter! Wire *</i>
PCB Editor	<i>Enter! Wire *</i>
PCB Editor	<i>Edit! Add Via</i>

\* Used when a T junction is made in a schematic database, or when an active layer is changed in a PCB database

# Vw

(Viewing Windows)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

USER / VIEW

---

## What It Does

Specifies the viewing windows.

---

## What It Looks Like

```
{Vw ix iy is n llx lly urx ury n llx lly urx ury ... }
```

where

**ix** is the initial x center of screen.

**iy** is the initial y center of screen.

**is** is the initial scale (zoom in/out).

**n llx lly urx ury** is each stored window (optional).

**n** is the user-assigned stored window number, 1-10.

**llx** is the x coordinate at the lower left corner of the window.

**lly** is the y coordinate at the lower left corner of the window.

**urx** is the x coordinate at the upper right corner of the window.

**ury** is the y coordinate at the upper right corner of the window.

# Vw

## Other Things You Need to Know

This information is used only by the P-CAD system.

## Example

```
{Vw 8250.00 7900.00 3.00 1 -4579.00 2446.00 10829.00  
15154.00}
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
All Editors	<i>Display! Store View</i>

# W

(Wire)

## Keyword

### Databases That Use It

Schematic

PCB

### Where You Find It

DETAIL / NET\_DEF / N / DG

### What It Does

Specifies a wire.

### What It Looks Like

```
{W x1 y1 x2 y2 ... }
```

where

**x** is the x coordinate at the end of a segment.

**y** is the y coordinate at the end of a segment.

### Other Things You Need to Know

Each x y defines a segment of wire.

### Example

```
{W 570.00 340.00 700.00 340.00 780.00 340.00 }
{W 700.00 340.00 700.00 350.00 }
{W 1660.00 1310.00 1600.00 1310.00 1580.00 1290.00 }
{W 960.00 280.00 1000.00 280.00 1020.00 260.00 }
```



# W

---

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>
Schematic Editor	<i>Enter! Wire</i>
PCB Editor	<i>Enter! Wire</i>

# Wd

(Width)

**Keyword**

---

## Databases That Use It

Schematic

PCB

---

## Where You Find It

DISPLAY

---

## What It Does

Specifies the line width.

---

## What It Looks Like

[Wd n]

where

**n** is a number from 0 to 255.

---

## Other Things You Need to Know

The width specified in DISPLAY is the default value for all lines. A new value can be specified anywhere in the PDIF file. When a new value is specified, that value becomes the default. If **n** is 0, width is the design program default value.

# Wd

## Example

```
[wd 0.00]
[wd 5.00]
[wd 10.00]
```

## P-CAD Cross-Reference

<i>Editor</i>	<i>View Layer Screen Option</i>	
All Editors	<i>Draw\Line</i>	wid: 0
	<i>Draw\Circle</i>	wid: 0
	<i>Draw\Rectangle</i>	wid: 0
	<i>Draw\2-Point Arc</i>	wid: 0
	<i>Draw\3-Point Arc</i>	wid: 0



# Netlist Import

# A

PDIF enables you to import a netlist containing component and connectivity information into the P-CAD system from another CAD system. You do this by using a text editor or another program (for importing data) to create a PDIF file with the necessary information and then entering the PDIF file into the PDIF File Reader.

You can import a netlist for any type of P-CAD database file. The most common use of netlist import is to translate a PCB netlist, but the process is equally effective for schematic netlists.

This chapter explains how to construct a PDIF file for this application.

## File Format

The PDIF file used to import netlists is an abbreviated version of the standard PDIF file that is described in Chapter 2, "Section and Keyword Reference." The sections and subsections used are shown below.

COMPONENT	
.	ENVIRONMENT
.	DETAIL
.	SUBCOMP
.	I
.	CN
.	IPT
.	ATR
.	IN

The file starts with a header that contains the COMPONENT, ENVIRONMENT, DETAIL, and SUBCOMP identifiers. The rest of the file consists of a series of I and CN records, one set for each component. The ATR section is optional for each component. The file ends with three closing brackets.

The format of the file is shown below.

```
{COMPONENT dbf {ENVIRONMENT file} {DETAIL {SUBCOMP
{I filename inv_name
{CN pin_name net pin_name net . . . }
{ATR {IN {PI x y} {Ro n} }}
}
{I filename inv_name
{CN pin_name net pin_name net . . . }
{ATR {IN . . . }}
}
. . .
}}}
```

All the section names and keywords are described in Chapter 2, "Section and Keyword Reference." They are reviewed briefly below.

COMPONENT specifies the P-CAD database to be created where *dbf* is the filename.

ENVIRONMENT specifies the starting environment for the database where *file* is the name of the layer structure file or board outline file that contains the starting environment.

DETAIL and SUBCOMP are the headings for the section of the PDIF file that holds the component data.

The I section shows an instance of a component where *filename* is the name of the part or symbol file that identifies the component, and *inv\_name* is the reference designator in a PCB design or the component name in a schematic design. Both values must be names recognizable by P-CAD.

The CN subsection of the I section shows component-to-net connectivities for the instance of the component where *pin\_name* identifies each pin, and *net* is the name of the net to which the pin is connected. Pin names are optional and can be omitted. The order in which the pins are entered is significant; see the CN section in Chapter 2.

The ATR/IN subsection of the I section can be used to specify component location. You can use the PI keyword to specify x and y coordinates and the Ro keyword to specify rotation. If location is not specified, all components in the P-CAD database will be located in a heap and you can use the Schematic and PCB Editors to place them wherever you want.

Since there are no internal COMP\_DEF sections, PDIF File Reader must be run with the Import Component Attributes check box filled.

## Example

The following is an example of a PDIF file that describes a PCB database.

```
% Project A2345 8/1/86
{COMPONENT mux.pcb {ENVIRONMENT lays.pcb} {DETAIL {SUBCOMP
  {I 74ls00.prt U1
    {CN 1 A' 2 B' 3 D00' 4 A' 5 B 6 D01' 7 GND 8 D10' 9 A 10 B' 11 D11' 12 A 13
      B 14 VCC
    }
  }
}
{I 74ls04.prt U2
  {CN 1 D00' 2 D00 3 D 01' 4 D01 5 D10' 6 D10 7 GND 8 D11 9 D11' 10 A' 11 A 12
    B' 13 B 14 VCC
  }
}
{I decap.prt C1 {CN VCC GND} }
{I decap.prt C2
  {CN * VCC * GND}
  {ATR {IN {PI 500 500} {Ro 1} }}
}
{I con20.prt J1
  {CN
    GND GND VCC VCC A D00 B
    D01 ? D10 ? D11
  }
  {ATR {IN {PI 500 0} {Ro 0} }}
}
}}}
```





# P-CAD to PDIF Cross-Reference

# B

Table B-1 cross-references P-CAD commands with PDIF data. It lists each P-CAD command or status area option, the databases, the PDIF sections and keywords that contain the corresponding data. Commands are listed first in alphabetical order, then status area options are listed in alphabetical order.

For further information about the P-CAD commands, refer to the *Command Reference* manual.

**Table B-1. P-CAD to PDIF Cross-Reference**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Dimension!Adjust	PCB	DISPLAY	Dmt Dor Dpt Dtd Dtl
Dimension!Angular	PCB	DISPLAY	Amt Apt
Dimension!Bind	PCB	DETAIL/ANNOTATE/DIMENSION	DArc DL DR DT
Dimension!Bind	PCB	DISPLAY	Dlt Gdt
Dimension!Center All	PCB	DETAIL/ANNOTATE/DIMENSION	DC
Dimension!Center One	PCB	DETAIL/ANNOTATE/DIMENSION	DC
Dimension!Configure	PCB	DETAIL/ANNOTATE/DIMENSION	Arrow
Dimension!Configure	PCB	DISPLAY	Afn Cent Daft Ddu Dli Ds Dts Dus Dwd Eba Elf Lss
Dimension!Leader	PCB	DETAIL/ANNOTATE/DIMENSION	DL DR DT
Display!Control Ratsnest	PCB	DETAIL/NET_DEF/N/ATR/IN	Rats
Display!Store View	SCH, SYM, SLB, PCB, PRT, PLB	USER/VIEW	Vw

**Table B-1. P-CAD to PDIF Cross-Reference (cont'd)**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Draw!2-Point Arc	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC DETAIL/NETDEF//DG	Arc
	SCH, SYM, SLB, PCB, PRT, PLB	DISPLAY	Wd
Draw!3-Point Arc	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC DETAIL/NETDEF//DG	Arc
	SCH, SYM, SLB, PCB, PRT, PLB	DISPLAY	Wd
Draw!Circle	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC	C
	SCH, SYM, SLB, PCB, PRT, PLB	DISPLAY	Wd
Draw!Circular Void	PCB, PRT	SYMBOL/PIC SYMBOL/PIC/POLY DETAIL/ANNOTATE DETAIL/ANNOTATE/POLY DETAIL/NET_DEF/N/DG/POLY DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/PAD_STACK/PAD_DEF/PIC/POLY DETAIL/SUBCOMP/COMP_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC/POLY	Cv
	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC	Fr
Draw!Flash	PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC	Fl
	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC DETAIL/ANNOTATE DETAIL/PAD_STACK/PAD_DEF/PIC DETAIL/SUBCOMP/COMP_DEF/PIC	L
Draw!Line	SCH, SYM, SLB, PCB, PRT, PLB	DISPLAY	Ls Wd

**Table B-1. P-CAD to PDIF Cross-Reference (cont'd)**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Draw!Polygon	PCB, PRT	SYMBOL/PIC/POLY	OI
		DETAIL/ANNOTATE/POLY	
		DETAIL/NET_DEF/N/DG/POLY	
		DETAIL/PAD_STACK/PIC/POLY	
	PCB, PRT	DETAIL/sUBCOMP/COMP_DEF/PIC/POLY	Poly
		SYMBOL/PIC	
		DETAIL/ANNOTATE	
		DETAIL/NET_DEF/N/DG	
	PCB, PRT	DETAIL/PAD_STACK/PIC	Pv
		DETAIL/SUBCOMP/COMP_DEF/PIC	
		SYMBOL/PIC	
		SYMBOL/PIC/Poly	
	PCB, PRT	DETAIL/ANNOTATE	R
		DETAIL/ANNOTATE/Poly	
		DETAIL/NET_DEF/N/DG/Poly	
		DETAIL/PAD_STACK/PIC	
	PCB, PRT, PLB	DETAIL/PAD_STACK/PIC/Poly	Wd
		DETAIL/SUBCOMP/COMP_DEF/PIC	
		DETAIL/SUBCOMP/COMP_DEF/PIC/Poly	
		DISPLAY	
	SCH, SYM, SLB, PCB, PRT, PLB	SYMBOL/PIC	T
		DETAIL/ANNOTATE	
		DETAIL/PAD_STACK/PAD_DEF/PIC	
		DETAIL/SUBCOMP/COMP_DEF/PIC	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/NET_DEF/N/DG	Tj
		SYMBOL/PIC	
		DETAIL/ANNOTATE	
		DETAIL/PAD_STACK/PAD_DEF/PIC	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/PIC	Tm
		DISPLAY	
		DETAIL/NET_DEF/N/DG	
		SYMBOL/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Tr
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Ts
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	V
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	At
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Pa
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Pl
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Ps
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Sc
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/EX	Un
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	
		DETAIL/SUBCOMP/COMP_DEF/ATR/EX	

**Table B-1. P-CAD to PDIF Cross-Reference (cont'd)**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Enter!Component Type	PCB, PRT	DETAIL/ATR/IN	Smd
		DETAIL/SUBCOMP/COMP_DEF/ATR/IN	
	SCH, SYM, SLB,	SYMBOL/ATR/IN	Ty
	PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/ATR/IN	
Enter!Global Net		DETAIL/PAD_STACK/PAD_DEF/ATR/IN	
	SCH, PCB	DETAIL/NET_DEF/N/ATR/IN	Ns
	Enter!Jumper	PCB, PRT	
		SYMBOL/ATR/IN	Jmp
Enter!Packaging Data		DETAIL/SUBCOMP/COMP_DEF/ATR/IN	
	PRT	SYMBOL/SPKG	Apn
		DETAIL/SUBCOMP/COMP_DEF/SPKG	
	SYM, SLB,	SYMBOL/PKG	Pid
	PRT, PLB	DETAIL/SYBCOMP/COMP_DEF/PKG	
		DETAIL/SUBCOMP//ASG	
	SYM, SLB	SYMBOL/PIN_DEF/PKG	Pnl
		DETAIL/SUBCOMP/COMP_DEF/PIN_DEF/PKG	
	SCH, SYM, SLB	SYMBOL/PKG	Rdl
		DETAIL/SUBCOMP/COMP_DEF/PKG	Sd
	PRT	DETAIL/SUBCOMP//ATR/IN	Sna
	PCB, PRT, PLB	SYMBOL/SPKG	Sp
Enter!Pin		DETAIL/SUBCOMP/COMP_DEF/SPKG	
	PRT	SYMBOL/SPKG	Apn
		DETAIL/SUBCOMP/COMP_DEF/SPKG	
	SYM, PRT	SYMBOL/PIN_DEF	Lq
		DETAIL/SUBCOMP/COMP_DEF/PIN_DEF	
	SCH, SYM, SLB,	SYMBOL/PIN_DEF/P	Ploc
Enter!Pin Type	PCB, PRT, PLB	DETAIL/SUBCOMP/COMP_DEF/PIN_DEF/P	
	SYM, PRT	SYMBOL/PIN_DEF	Lq
		DETAIL/SUBCOMP/COMP_DEF/PIN_DEF	
	SYM, PRT	SYMBOL/PIN_DEF/P	Pt
		DETAIL/SUBCOMP/COMP_DEF/PIN_DEF/P	
Enter!Polygon	PCB	SYMBOL/PIC/POLY	OI
		DETAIL/ANNOTATE/POLY	
		DETAIL/NET_DEF/N/DG/POLY	
		DETAIL/PAD_STACK/PIC/POLY	
		DETAIL/sUBCOMP/COMP_DEF/PIC/POLY	
	PCB	SYMBOL/PIC	Poly
		DETAIL/ANNOTATE	
		DETAIL/NET_DEF/N/DG	
		DETAIL/PAD_STACK/PIC	
		DETAIL/SUBCOMP/COMP_DEF/PIC	
	PCB	ENVIRONMENT	Polyap
		SYMBOL/PIC	
		DETAIL/ANNOTATE	
		DETAIL/NET_DEF/N/DG	
		DETAIL/PAD_STACK/PAD_DEF/PIC	
		DETAIL/SUBCOMP/COMP_DEF/PIC	

**Table B-1. P-CAD to PDIF Cross-Reference (cont'd)**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Enter!Ref. Des. & Section	SCH	DETAIL/SUBCOMP/I/ASG	Pn Rd
Enter!Sheet Number	SCH	DETAIL/SUBCOMP/COMP_DEF/ATR/EX DETAIL/SUBCOMP/I/ATR/EX	At
Enter!Wire	SCH	DETAIL/NET_DEF/N/ATR/IN DETAIL/SUBCOMP/I/ATR/IN	Un
	SCH, PCB	DETAIL/NET_DEF/N/DG	V W
Environment!Assign Layer Pairs	PCB	ENVIRONMENT	Lyrphid Ssymtbl
Environment!Attach Padstacks	PCB	ENVIRONMENT	SSTfile
Environment!Change Units	SCH, SYM, SLB, PCB, PRT, PLB	ENVIRONMENT	DBunit
Environment!Detail Mode	SCH, SYM, SLB, PCB, PRT, PLB	USER/VIEW	Mode
Environment!Edit Aperture Table	PCB	APERTURE_TABLE	Apfile Apcomm Apnum Aprot Aptype Apver Dcode Idia Iht Iwd Odia Oht Owd Shp Sides Ta Ti Twd Apr
Environment!Inner Plane Apertures	PCB	ENVIRONMENT	Apr
Environment!Min. Polygon Size	PCB	ENVIRONMENT	PSIZ
Environment!Polygon Flash Clearance	PCB	DISPLAY	Pfc
Environment!Polygon Wire Clearance	PCB	ENVIRONMENT	PCLR
Environment!Symbol Mode	SCH, SYM, SLB, PCB, PRT, PLB	USER/VIEW	Mode

**Table B-1. P-CAD to PDIF Cross-Reference (cont'd)**

<b>P-CAD Command or Option</b>	<b>Database Type</b>	<b>PDIF Section</b>	<b>PDIF Keyword</b>
Name!Component	SCH, SYM, SLB, PCB, PRT, PLB	DETAIL/SUBCOMP//ATR/IN	Nl
	SCH	DETAIL/NET_DEF/N/ATR/IN	Un
		DETAIL/SUBCOMP//ATR/IN	
Name!Net	SCH	DETAIL/NET_DEF/N/DG	Nn
	SCH	DETAIL/NET_DEF/N/ATR/IN	Un
		DETAIL/SUBCOMP//ATR/IN	
Rotate!Component	SCH, PCB	DETAIL/SUBCOMP//ATR/IN	Pa
View Layer	SCH, SYM, SLB, PCB, PRT, PLB	USER	
	SCH, SYM, SLB, PCB, PRT, PLB	DISPLAY	Ly
	SCH, SYM, SLB, PCB, PRT, PLB	ENVIRONMENT	Lyrstr
	PCB, PRT, PLB		
Minus: 0	PCB	DISPLAY	Amt
Minus ("): 0.000	PCB	DISPLAY	Dmt
Plus: 0	PCB	DISPLAY	Apt
Plus ("): 0.000	PCB	DISPLAY	Dpt
Grd: 50:50	SCH, SYM, SLB	USER / VIEW	Gs
	PCB, PRT, PLB		
Wid: 0	SCH, SYM, SLB	SYMBOL / PIC	L
	PCB, PRT, PLB	DETAIL / ANNOTATE DETAIL / PAD_STACK / PAD_DEF / PIC DETAIL / SUBCOMP / COMP_DEF / PIC	R
	SCH, SYM, SLB	DISPLAY	Wd
	PCB, PRT, PLB		
Angle : 0	SCH, PCB	DETAIL / SUBCOMP / I / ATR / IN	Pa
Apw: 0	PCB	ENVIRONMENT SYMBOL / PIC DETAIL / ANNOTATE DETAIL / NET_DEF / N / DG DETAIL / PAD_STACK / PAD_DEF / PIC DETAIL / SUBCOMP / COMP_DEF / PIC	Polyap
		DISPLAY	
Size: 25	SCH, SYM, SLB PCB, PRT, PLB		

Table B-1. P-CAD to PDIF Cross-Reference (cont'd)

P-CAD Command or Option	Database Type	PDIF Section	PDIF Keyword
ShwTol	PCB	DISPLAY	Dtl
Mirror	SCH, SYM SCH, SYM, SLB PCB, PRT, PLB	DETAIL / SUBCOMP / I / ATR / IN DISPLAY	Mr Tm
Ratsnest	PCB	DETAIL / NET_DEF / N / ATR / IN	Rats
♦ Horiz (Vert)	PCB	DISPLAY	Dor
♦ THoriz (TVert)	PCB	DISPLAY	Dtd
♦ Solid (Dashed, Dotted)	SCH, SYM, SLB PCB, PRT, PLB	SYMBOL / PIC DETAIL / ANNOTATE DETAIL / PAD_STACK / PAD_DEF / PIC DETAIL / SUBCOMP / COMP_DEF / PIC	L R
	SCH, SYM, SLB PCB, PRT, PLB	DISPLAY	Ls
♦ Orth (Any, Diag)	SCH, SYM, SLB PCB, PRT, PLB	SYMBOL / PIC DETAIL / ANNOTATE DETAIL / PAD_STACK / PAD_DEF / PIC DETAIL / SUBCOMP / COMP_DEF / PIC	L
♦ GATE	SCH, SYM, SLB PCB, PRT, PLB	DISPLAY	Ly
♦ Left (Right, Center)	SCH, SYM, SLB PCB, PRT, PLB	DISPLAY	Tj
♦ Bottom (Top)	PCB	DETAIL / SUBCOMP / I / ATR / IN	Ps
(Top, Center)	SCH, SYM, SLB PCB, PRT, PLB	DISPLAY	Tj
♦ 0 Deg (90, 180, 270)	SCH, SYM PCB, PRT	DETAIL / SUBCOMP / I / ATR / IN	Ro
♦ 0 Deg (90, 180, 270)	SCH, SYM, SLB PCB, PRT, PLB	DISPLAY	Tr





# Sample PDIF Files

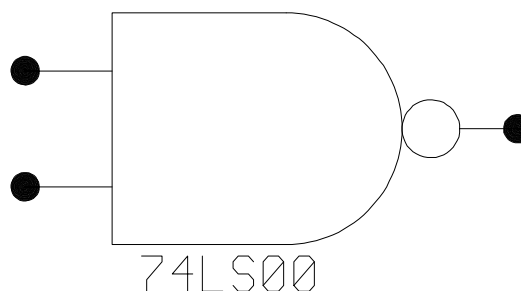
# C

The sample files in this appendix illustrate the types of P-CAD PCB design databases. You can use these sample PDIF files to become familiar with the PDIF programs and file structure. All files are shown in "compressed" format. Sample file ex4.pdf shows a PDIF file for a PCB database with an integrated aperture table attached.

## Schematic Symbol: 74LS00

Symbol File:

74ls00.sym



PDIF File:

74ls00.pdf

```
%*****
%  Program   : pdfout VERSION 8.5                *
%  Date      : Aug 15 1994                        *
%  Time      : 04:30:56 PM                        *
%  File In   : 74ls00.sym                        *
%  File Out  : 74ls00.pdf                        *
%  Format    : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

{COMPONENT 74ls00.sym
{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdfout Version 8.5"}
{DBtype "Schematic"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994    11:29 a.m.    "}
{DBunit "CENTIMIL"}
{DBgrid 10}
```

```

{Lyrstr "WIRES" 1 "BUS" 1 "GATE" 2 "IEEE" 2 "PINFUN" 3 "PINNUM" 1 "PINNAM" 6
"PINCON" 4 "REFDES" 2 "ATTR" 6 "SDOT" 1 "DEVICE" 5 "OUTLIN" 5
"ATTR2" 6 "NOTES" 6 "NETNAM" 4 "CMPNAM" 5 "BORDER" 5 "$$NULL" 0}
}
{USER
{VIEW
{Mode SYMB}
{Vw -70.00 40.00 1.00}
{Lv 6 2 2 1 0 0 2 1 1 2 0 0 1 1 0 0 0 0}
{Gs 10.00 10.00}
}
}
{DISPLAY
[Ly "PINNUM"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
}
{SYMBOL
{PIN_DEF
[Ly "PINCON"]
{P INA {Pt "INPUT"}{Lq 1}{Ploc -140.00 60.00}}
{P INB {Pt "INPUT"}{Lq 1}{Ploc -140.00 20.00}}
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 30.00 40.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
{Rdl -60.00 40.00}
[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pnl -120.00 70.00}
{Pnl -120.00 30.00}
[Tj "LC"]
{Pnl 20.00 50.00}
{Pid 74LS00 }
{Sd A 1 2 3}
{Sd B 4 5 6}
{Sd C 10 9 8}
{Sd D 12 13 11}
}
{PIC
[Ly "GATE"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
{C 0.00 40.00 10.00 }
{L 10.00 40.00 30.00 40.00 }
{Arc -50.00 40.00 -50.00 0.00 -50.00 80.00}
{L -50.00 80.00 -110.00 80.00 -110.00 0.00 -50.00 0.00 }
{L -110.00 60.00 -140.00 60.00 }
{L -110.00 20.00 -140.00 20.00 }
[Ly "IEEE"]
{L -10.00 50.00 10.00 40.00 }
[Tj "CB"]
{T "&" -60.00 60.00}

```

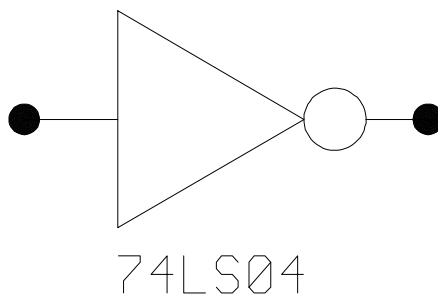
```

{L -10.00 40.00 30.00 40.00 }
{L -140.00 60.00 -110.00 60.00 }
{L -140.00 20.00 -110.00 20.00 }
{R -110.00 0.00 -10.00 80.00 }
[Ly "DEVICE"]
[Tj "CC"]
{T "74LS00" -70.00 -10.00}
}
{ATR
{IN
{Org -140.00 20.00}
{Tj 4}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{At PCL (1,1,"d","d") -70.00 -30.00}
}
}
{DETAIL
{ANNOTATE
}
{NET_DEF
{N INA
{ATR
{IN
{Un "Y"}
}
}
}
{N INB
{ATR
{IN
{Un "Y"}
}
}
}
{N OUTY
{ATR
{IN
{Un "Y"}
}
}
}
}
{SUBCOMP
}
}
}
}

```

## Schematic Symbol 74LS04

**Symbol File:** 74ls04.sym



**PDF File:** 74ls04.pdf

```
%*****
% Program : pdifout VERSION 8.5 *
% Date : Aug 15 1994 *
% Time : 04:31:08 PM *
% File In : 74ls04.sym *
% File Out : 74ls04.pdf *
% Format : P-CAD DATABASE INTERCHANGE FORMAT *
%*****
```

```
{COMPONENT 74ls04.sym
{ENVIRONMENT
{PDFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "Schematic"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 11:30 a.m. "}
{DBunit "CENTIMIL"}
{DBgrid 10}
{Lyrstr "WIRES" 1 "BUS" 1 "GATE" 2 "IEEE" 2 "PINFUN" 3 "PINNUM" 1 "PINNAM" 6
"PINCON" 4 "REFDES" 2 "ATTR" 6 "SDOT" 1 "DEVICE" 5 "OUTLIN" 5
"ATTR2" 6 "NOTES" 6 "NETNAM" 4 "CMPNAM" 5 "BORDER" 5 "$$NULL" 0}
}
```

```
{USER
{VIEW
{Mode SYMB}
{Vw -90.00 90.00 1.00}
{Lv 6 2 2 1 0 0 2 1 1 2 0 0 1 1 0 0 0 0}
{Gs 10.00 10.00}
}
}
```

```

{DISPLAY
[Ly "PINNUM"]
[Ln "SOLID"][Wd 0.00]
[Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
}

{SYMBOL
{PIN_DEF
[Ly "PINCON"]
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc -10.00 90.00}}
{P INA {Pt "INPUT"}{Lq 0}{Ploc -140.00 90.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "LC"][Tr 0][Tm "N"]
{Rdl -90.00 130.00}

[Ly "PINNUM"]
[Ts 15.00]
{Pnl -20.00 100.00}
[Tj "RC"]
{Pnl -120.00 100.00}

{Pid 74LS04 }
{Sd A 2 1}
{Sd B 4 3}
{Sd C 6 5}
{Sd D 8 9}
{Sd E 10 11}
{Sd F 12 13}
}

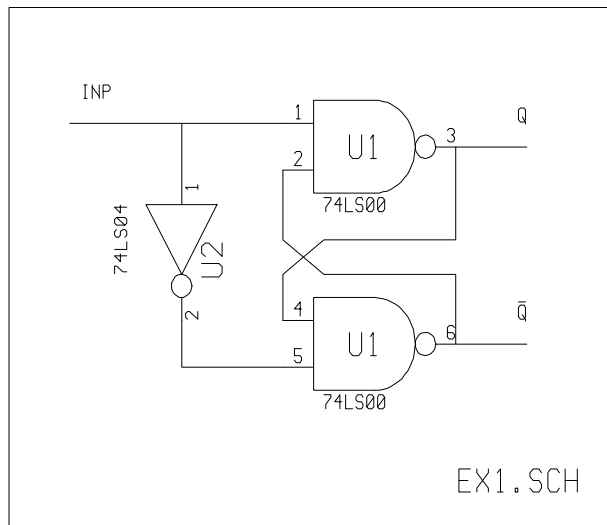
{PIC
[Ly "GATE"]
[Ln "SOLID"][Wd 0.00]
[Ts 15.00][Tj "RC"][Tr 0][Tm "N"]
{C -40.00 90.00 10.00 }
{L -110.00 90.00 -140.00 90.00 }
{L -110.00 125.00 -110.00 55.00 -50.00 90.00 -110.00 125.00 }
{L -30.00 90.00 -10.00 90.00 }
[Ly "IEEE"]
[Tj "CC"]
{T "1" -80.00 100.00}
{L -30.00 90.00 -50.00 100.00 }
{L -50.00 90.00 -10.00 90.00 }
{R -110.00 55.00 -50.00 125.00 }
{L -110.00 90.00 -140.00 90.00 }
[Ly "DEVICE"]
{T "74LS04" -80.00 40.00}
}

{ATR
{IN
{Org -140.00 90.00}
{Ty 1}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{At PCL (1,1,"D","D") -80.00 10.00}
}

```

```
}  
}  
}  
  
{DETAIL  
{ANNOTATE  
}  
  
{NET_DEF  
{N OUTY  
{ATR  
{IN  
{Un "Y"}  
}  
}  
}  
{N INA  
{ATR  
{IN  
{Un "Y"}  
}  
}  
}  
  
{SUBCOMP  
}  
}  
}
```

## Flat Schematic EX1

Schematic File: **ex1.sch**PDF File: **ex1.pdf**

```

%*****
% Program   : pdifout VERSION 8.5                      *
% Date      : Aug 15 1994                               *
% Time      : 04:30:12 PM                               *
% File In   : ex1.sch                                   *
% File Out  : ex1.pdf                                   *
% Format    : P-CAD DATABASE INTERCHANGE FORMAT        *
%*****

{COMPONENT ex1.sch
{ENVIRONMENT
{PDFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "Schematic"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994    4:27 p.m.    "}
{DBunit "CENTIMIL"}
{DBgrid 10}
{Lyrstr "WIRES" 1 "BUS" 1 "GATE" 2 "IEEE" 2 "PINFUN" 3 "PINNUM" 1 "PINNAM" 6
"PINCON" 4 "REFDES" 2 "ATTR" 6 "SDOT" 1 "DEVICE" 5 "OUTLIN" 5
"ATTR2" 6 "NOTES" 6 "NETNAM" 4 "CMPNAM" 5 "BORDER" 5 "$$NULL" 0}
}

```

```
{USER
{VIEW
{Mode DETL}
{Vw -110.00 45.00 1.21}
{Lv 16 2 2 1 0 0 1 1 1 1 0 0 1 1 0 0 2 0 2}
{Gs 10.00 10.00}
}
}

{DISPLAY
[Ly "NETNAM"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
}

{SYMBOL
{PIN_DEF
}
{PIC
}

{ATR
{IN
{Org -21474836.47 -21474836.47}
{Ty 255}
}
}
}

{DETAIL
{ANNOTATE
[Ly "BORDER"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
{R -410.00 -180.00 190.00 270.00 }
[Ts 25.00][Tj "LB"]
{T "EX1.SCH" 30.00 -150.00}
}

{NET_DEF
{N OP
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{W -240.00 0.00 -240.00 -40.00 -140.00 -40.00 }
}
{ATR
{IN
{Un "Y"}
}
}
}
{N INP
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{V -240.00 170.00 15}
```



```

(W -240.00 130.00 -240.00 170.00 }
(W -140.00 170.00 -240.00 170.00 -350.00 170.00 }
[Ly "NETNAM"]
[Ts 15.00]
{Nn -340.00 190.00}
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
{N Q
{DG
[Ly "WIRES"]
[Ln "SOLID"]{Wd 0.00}
[Ts 15.00][Tj "LB"]{Tr 0}[Tm "N"]
(W -140.00 0.00 -140.00 40.00 -100.00 70.00 30.00 70.00 30.00 150.00
100.00 150.00 }
[Ly "NETNAM"]
{Nn 90.00 170.00}
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
{N Q'
{DG
[Ly "WIRES"]
[Ln "SOLID"]{Wd 0.00}
[Ts 15.00][Tj "LB"]{Tr 0}[Tm "N"]
(W -140.00 130.00 -140.00 70.00 -100.00 40.00 30.00 40.00 30.00 -20.00
100.00 -20.00 }
[Ly "NETNAM"]
{Nn 90.00 0.00}
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
}

{SUBCOMP
{COMP_DEF 74ls04.sym
{PIN_DEF
[Ly "PINCON"]
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 130.00 0.00}}
{P INA {Pt "INPUT"}{Lq 0}{Ploc 0.00 0.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "LC"]{Tr 0}[Tm "N"]
{Rdl 50.00 40.00}

```

```
[Ly "PINNUM"]
[Ts 15.00]
{Pnl 120.00 10.00}
[Tj "RC"]
{Pnl 20.00 10.00}

{Pid 74LS04 }
{Sd A 2 1}
{Sd B 4 3}
{Sd C 6 5}
{Sd D 8 9}
{Sd E 10 11}
{Sd F 12 13}
}

{PIC
[Ly "GATE"]
[Ls "SOLID"] [Wd 0.00]
[Ts 15.00][Tj "RC"] [Tr 0][Tm "N"]
{C 100.00 0.00 10.00 }
{L 30.00 0.00 0.00 0.00 }
{L 30.00 35.00 30.00 -35.00 90.00 0.00 30.00 35.00 }
{L 110.00 0.00 130.00 0.00 }
[Ly "IEEE"]
[Tj "CC"]
{T "1" 60.00 10.00}
{L 110.00 0.00 90.00 10.00 }
{L 90.00 0.00 130.00 0.00 }
{R 30.00 -35.00 90.00 35.00 }
{L 30.00 0.00 0.00 0.00 }
[Ly "DEVICE"]
{T "74LS04" 60.00 -50.00}
}
{ATR
{IN
{Ty 1}
}
}
}
{I 74ls04.sym UC00000002
{CN OP INP}
{ASG A
[Ly "REFDES"]
[Ts 25.00][Tj "LC"] [Tr 0][Tm "N"]
{Rd "U2" 40.00 -50.00}
[Ly "PINNUM"]
[Ts 15.00]
{Pn "2" 10.00 -120.00}
[Tj "RC"]
{Pn "1" 10.00 -20.00}
}
{ATR
{IN
{PI -240.00 130.00}
{Ro 3}
}
}
```

```

{EX
  [Ly "ATTR"]
  [Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
  {At PCL (1,1,"D","D") -80.00 -60.00}
}
}
}
{COMP_DEF 74ls00.sym
{PIN_DEF
  [Ly "PINCON"]
  {P INA {Pt "INPUT"}{Lq 1}{Ploc 0.00 40.00}}
  {P INB {Pt "INPUT"}{Lq 1}{Ploc 0.00 0.00}}
  {P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 170.00 20.00}}
}
{PKG
  [Ly "REFDES"]
  [Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
  {Rdl 80.00 20.00}
  [Ly "PINNUM"]
  [Ts 15.00][Tj "RC"]
  {Pnl 20.00 50.00}
  {Pnl 20.00 10.00}
  [Tj "LC"]
  {Pnl 160.00 30.00}
  {Pid 74LS00 }
  {Sd A 1 2 3}
  {Sd B 4 5 6}
  {Sd C 10 9 8}
  {Sd D 12 13 11}
}

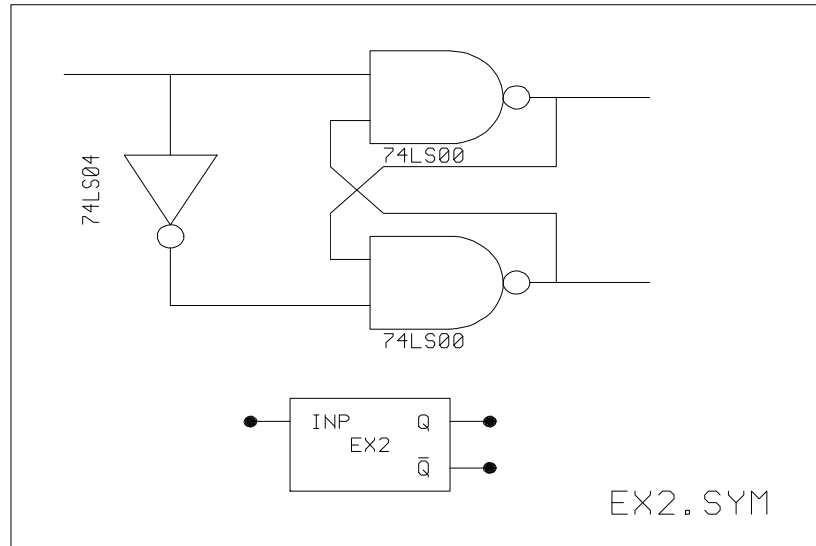
{PIC
  [Ly "GATE"]
  [Ls "SOLID"][Wd 0.00]
  [Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
  {C 140.00 20.00 10.00 }
  {L 150.00 20.00 170.00 20.00 }
  {Arc 90.00 20.00 90.00 -20.00 90.00 60.00}
  {L 90.00 60.00 30.00 60.00 30.00 -20.00 90.00 -20.00 }
  {L 30.00 40.00 0.00 40.00 }
  {L 30.00 0.00 0.00 0.00 }
  [Ly "IEEE"]
  {L 130.00 30.00 150.00 20.00 }
  [Tj "CB"]
  {T "&" 80.00 40.00}
  {L 130.00 20.00 170.00 20.00 }
  {L 0.00 40.00 30.00 40.00 }
  {L 0.00 0.00 30.00 0.00 }
  {R 30.00 -20.00 130.00 60.00 }
  [Ly "DEVICE"]
  [Tj "CC"]
  {T "74LS00" 70.00 -30.00}
}
{ATR
{IN
  {Ty 4}
}
}
}
{I 74ls00.sym UC00000001
{CN Q OP Q'}
{ASG B
  [Ly "REFDES"]
  [Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
  {Rd "U1" 80.00 20.00}
}
}

```

```
[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pn "4" 20.00 50.00}
{Pn "5" 20.00 10.00}
[Tj "LC"]
{Pn "6" 160.00 30.00}
}
{ATR
{IN
{PI -140.00 -40.00}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"]
{At PCL (1,1,"d","d") 70.00 -50.00}
}
}
}
{I 74ls00.sym UC00000000
{CN INP Q' Q}
{ASG A
[Ly "REFDES"]
[Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
{Rd "U1" 80.00 20.00}
[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pn "1" 20.00 50.00}
{Pn "2" 20.00 10.00}
[Tj "LC"]
{Pn "3" 160.00 30.00}
}
{ATR
{IN
{PI -140.00 130.00}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"]
{At PCL (1,1,"d","d") 70.00 -50.00}
}
}
}
}
}
}
```

## Hierarchical Subcircuit EX2

**Symbol File:** **ex2.sym**



**PDIF File:** **ex2.pdf**

```
%*****
% Program   : pdifout VERSION 8.5          *
% Date      : Aug 15 1994                  *
% Time      : 04:30:41 PM                  *
% File In   : ex2.sym                      *
% File Out  : ex2.pdf                      *
% Format    : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

{COMPONENT ex2.sym

{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "Schematic"}
{DBvrev 2.09}
{DBtime Aug. 15, 1994    4:21 p.m.    "}
{DBunit "CENTIMIL"}
{DBgrid 10}
{Lyrstr "WIRES" 1 "BUS" 1 "GATE" 2 "IEEE" 2 "PINFUN" 3 "PINNUM" 1 "PINNAM" 6
"PINCON" 4 "REFDES" 2 "ATTR" 6 "SDOT" 1 "DEVICE" 5 "OUTLIN" 5
"ATTR2" 6 "NOTES" 6 "NETNAM" 4 "CMPNAM" 5 "BORDER" 5 "$$NULL" 0}
}
```

```

{USER
{VIEW
{Mode SYMB}
{Vw -110.00 45.00 1.21}
{Lv 16 2 2 2 0 0 1 2 2 1 0 0 2 1 0 0 2 0 2}
{Gs 10.00 10.00}
}
}

{DISPLAY
[Ly "NETNAM"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
}

{SYMBOL
{PIN_DEF
{PINCON}
[Ly "PINCON"]
{P INP {Pt "INPUT"}{Lq 0}{Ploc -240.00 -130.00}}
{P Q {Pt "OUTPUT"}{Lq 0}{Ploc -60.00 -130.00}}
{P Q' {Pt "OUTPUT"}{Lq 0}{Ploc -60.00 -170.00}}
}

{PIC
[Ly "GATE"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
{L -90.00 -130.00 -60.00 -130.00 }
{L -90.00 -170.00 -60.00 -170.00 }
{R -210.00 -190.00 -90.00 -110.00 }
{L -240.00 -130.00 -210.00 -130.00 }
[Ly "PINNAM"]
{T "INP" -190.00 -130.00}
{T "Q" -110.00 -130.00}
{T "Q'" -110.00 -170.00}
[Ly "DEVICE"]
{T "EX2" -150.00 -150.00}
}

{ATR
{IN
{Org -240.00 -130.00}
{Ty 256}
}
}

{DETAIL
{ANNOTATE
[Ly "BORDER"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{T "EX2.SYM" 30.00 -210.00}
{R -410.00 -230.00 190.00 220.00 }
}

{NET_DEF
{N INP
{DG
[Ly "BORDER"]

```

```

[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{V -240.00 170.00 15}
[Ly "WIRES"]
{W -240.00 130.00 -240.00 170.00 }
{W -140.00 170.00 -240.00 170.00 -350.00 170.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
}
{N Q
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{W -140.00 0.00 -140.00 40.00 -100.00 70.00 30.00 70.00 30.00 150.00
100.00 150.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
}
{N Q'
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{W -140.00 130.00 -140.00 70.00 -100.00 40.00 30.00 40.00 30.00 -20.00
100.00 -20.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
}
{N OP
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "LB"][Tr 0][Tm "N"]
{W -240.00 0.00 -240.00 -40.00 -140.00 -40.00 }
}
{ATR
{IN
{Un "Y"}
}
}
}

```

```

}
}

{SUBCOMP
{COMP_DEF 74ls04.sym
{PIN_DEF
[Ly "PINCON"]
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 130.00 0.00}}
{P INA {Pt "INPUT"}{Lq 0}{Ploc 0.00 0.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "LC"][Tr 0][Tm "N"]
{Rdl 50.00 40.00}

[Ly "PINNUM"]
[Ts 15.00]
{Pnl 120.00 10.00}
[Tj "RC"]
{Pnl 20.00 10.00}

{Pid 74LS04 }
{Sd A 2 1}
{Sd B 4 3}
{Sd C 6 5}
{Sd D 8 9}
{Sd E 10 11}
{Sd F 12 13}
}

{PIC
[Ly "GATE"]
[LS "SOLID"][Wd 0.00]
[Ts 15.00][Tj "RC"][Tr 0][Tm "N"]
{C 100.00 0.00 10.00 }
{L 30.00 0.00 0.00 0.00 }
{L 30.00 35.00 30.00 -35.00 90.00 0.00 30.00 35.00 }
{L 110.00 0.00 130.00 0.00 }
[Ly "IEEE"]
[Tj "CC"]
{T "1" 60.00 10.00}
{L 110.00 0.00 90.00 10.00 }
{L 90.00 0.00 130.00 0.00 }
{R 30.00 -35.00 90.00 35.00 }
{L 30.00 0.00 0.00 0.00 }
[Ly "DEVICE"]
{T "74LS04" 60.00 -50.00}
}
{ATR
{IN
{Ty 1}
}
}
}
{I 74ls04.sym UC00000002
{CN OP INP}
{ASG A
[Ly "REFDES"]
[Ts 25.00][Tj "LC"][Tr 0][Tm "N"]
{Rd "U2" 40.00 -50.00}
[Ly "PINNUM"]

```



```

[Ts 15.00]
{Pn "2" 10.00 -120.00}
[Tj "RC"]
{Pn "1" 10.00 -20.00}
}
{ATR
{IN
{PI -240.00 130.00}
{Ro 3}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{At PCL (1,1,"D","D") -80.00 -60.00}
}
}
{COMP_DEF 74ls00.sym
{PIN_DEF
[Ly "PINCON"]
{P INA {Pt "INPUT"}{Lq 1}{Ploc 0.00 40.00}}
{P INB {Pt "INPUT"}{Lq 1}{Ploc 0.00 0.00}}
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 170.00 20.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
{Rdl 80.00 20.00}

[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pnl 20.00 50.00}
{Pnl 20.00 10.00}
[Tj "LC"]
{Pnl 160.00 30.00}

{Pid 74LS00 }
{Sd A 1 2 3}
{Sd B 4 5 6}
{Sd C 10 9 8}
{Sd D 12 13 11}
}

{PIC
[Ly "GATE"]
[LS "SOLID"][Wd 0.00]
[Ts 15.00][Tj "LC"][Tr 0][Tm "N"]
{C 140.00 20.00 10.00 }
{L 150.00 20.00 170.00 20.00 }
{Arc 90.00 20.00 90.00 -20.00 90.00 60.00}
{L 90.00 60.00 30.00 60.00 30.00 -20.00 90.00 -20.00 }
{L 30.00 40.00 0.00 40.00 }
{L 30.00 0.00 0.00 0.00 }
[Ly "IEEE"]
{L 130.00 30.00 150.00 20.00 }
[Tj "CB"]
{T "&" 80.00 40.00}
{L 130.00 20.00 170.00 20.00 }
{L 0.00 40.00 30.00 40.00 }
{L 0.00 0.00 30.00 0.00 }
{R 30.00 -20.00 130.00 60.00 }
[Ly "DEVICE"]

```

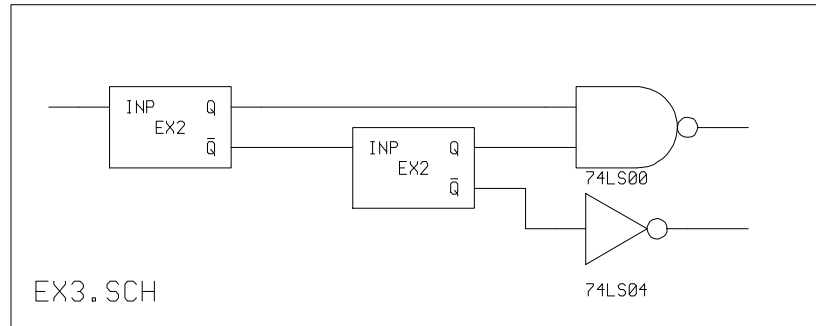
```

[Tj "CC"]
{T "74LS00" 70.00 -30.00}
}
{ATR
{IN
{Ty 4}
}
}
}
{l 74ls00.sym UC00000001
{CN Q OP Q'}
{ASG B
[Ly "REFDES"]
[Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
{Rd "U1" 80.00 20.00}
[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pn "4" 20.00 50.00}
{Pn "5" 20.00 10.00}
[Tj "LC"]
{Pn "6" 160.00 30.00}
}
{ATR
{IN
{PI -140.00 -40.00}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"]
{At PCL (1,1,"d","d") 70.00 -50.00}
}
}
}
{l 74ls00.sym UC00000000
{CN INP Q' Q}
{ASG A
[Ly "REFDES"]
[Ts 25.00][Tj "CC"][Tr 0][Tm "N"]
{Rd "U1" 80.00 20.00}
[Ly "PINNUM"]
[Ts 15.00][Tj "RC"]
{Pn "1" 20.00 50.00}
{Pn "2" 20.00 10.00}
[Tj "LC"]
{Pn "3" 160.00 30.00}
}
{ATR
{IN
{PI -140.00 130.00}
}
{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"]
{At PCL (1,1,"d","d") 70.00 -50.00}
}
}
}
}
}
}
}
}

```

## Hierarchical Schematic EX3

Schematic File: **ex3.sch**



PDF File: **ex3.pdf**

```
%*****
% Program : pdifout VERSION 8.5
% Date : Aug 15 1994
% Time : 04:30:26 PM
% File In : ex3.sym
% File Out : ex3.pdf
% Format : P-CAD DATABASE INTERCHANGE FORMAT
%*****

{COMPONENT ex3.sch

{ENVIRONMENT
{PDFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "Schematic"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 4:26 p.m."}
{DBunit "CENTIMIL"}
{DBgrid 10}
{Lyrstr "WIRES" 1 "BUS" 1 "GATE" 2 "IEEE" 2 "PINFUN" 3 "PINNUM" 1 "PINNAM" 6
"PINCON" 14 "REFDES" 2 "ATTR" 6 "SDOT" 1 "DEVICE" 5 "OUTLIN" 5
"ATTR2" 6 "NOTES" 6 "NETNAM" 4 "CMPNAM" 5 "BORDER" 5 "$$NULL" 0}
}

{USER
{VIEW
{Mode DETL}
{Vw 40.00 -5.00 1.54}
{Lv 1 2 0 2 0 0 2 2 2 2 0 1 1 0 2 1 1 0 2}
{Gs 10.00 10.00}
}
}
```

```

{DISPLAY
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
}

{SYMBOL
{PIN_DEF
}

{PIC
}

{ATR
{IN
{Org -21474836.47 -21474836.47}
{Tj 255}
}
}
}

{DETAIL
{ANNOTATE
[Ly "BORDER"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "CB"][Tr 0][Tm "N"]
{T "EX3.SCH" -284.00 -134.00}
{R -367.00 -159.00 433.00 161.00 }
}

{NET_DEF
{N C
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "CB"][Tr 0][Tm "N"]
{W -120.00 20.00 -60.00 20.00 }
}
{ATR
{IN
{Un "Y"}
}
}
}
{N B
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "CB"][Tr 0][Tm "N"]
{W -120.00 60.00 160.00 60.00 }
}
{ATR
{IN
{Un "Y"}
}
}
}
{N D
{DG
[Ly "WIRES"]
[Ls "SOLID"][Wd 0.00]
[Ts 25.00][Tj "CB"][Tr 0][Tm "N"]

```

```

{W 160.00 20.00 120.00 20.00 }
}
{ATR
{IN
{Un "Y"}
}
}
{N E
{DG
[Ly "WIRES"]
[Ln "SOLID"] [Wd 0.00]
[Ln 25.00] [Tj "CB"] [Tr 0] [Tm "N"]
{W 120.00 -20.00 140.00 -20.00 140.00 -60.00 170.00 -60.00 }
}
{ATR
{IN
{Un "Y"}
}
}
{N A
{DG
[Ly "WIRES"]
[Ln "SOLID"] [Wd 0.00]
[Ln 25.00] [Tj "CB"] [Tr 0] [Tm "N"]
{W -300.00 60.00 -330.00 60.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
{N G
{DG
[Ly "WIRES"]
[Ln "SOLID"] [Wd 0.00]
[Ln 25.00] [Tj "CB"] [Tr 0] [Tm "N"]
{W 300.00 -60.00 360.00 -60.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}
{N F
{DG
[Ly "WIRES"]
[Ln "SOLID"] [Wd 0.00]
[Ln 25.00] [Tj "CB"] [Tr 0] [Tm "N"]
{W 330.00 40.00 360.00 40.00 }
}
{ATR
{IN
{Ns 1}
{Un "Y"}
}
}

```

```

}
}

{SUBCOMP
{COMP_DEF 74ls00.sym
{PIN_DEF
{Ly "PINCON"}
{P INA {Pt "INPUT"}{Lq 1}{Ploc 0.00 40.00}}
{P INB {Pt "INPUT"}{Lq 1}{Ploc 0.00 0.00}}
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 170.00 20.00}}
}
{PKG
{Ly "REFDES"}
{Ts 25.00}[Tj "CC"]{Tr 0}[Tm "N"]
{Rdl 80.00 20.00}

{Ly "PINNUM"}
{Ts 15.00}[Tj "RC"]
{Pnl 20.00 50.00}
{Pnl 20.00 10.00}
{Tj "LC"}
{Pnl 160.00 30.00}

{Pid 74LS00 }
{Sd A 1 2 3}
{Sd B 4 5 6}
{Sd C 10 9 8}
{Sd D 12 13 11}
}

{PIC
{Ly "GATE"}
{Ls "SOLID"}{Wd 0.00}
{Ts 15.00}[Tj "LC"]{Tr 0}[Tm "N"]
{C 140.00 20.00 10.00 }
{L 150.00 20.00 170.00 20.00 }
{Arc 90.00 20.00 90.00 -20.00 90.00 60.00}
{L 90.00 60.00 30.00 60.00 30.00 -20.00 90.00 -20.00 }
{L 30.00 40.00 0.00 40.00 }
{L 30.00 0.00 0.00 0.00 }
{Ly "IEEE"}
{L 130.00 30.00 150.00 20.00 }
{Tj "CB"}
{T "&" 80.00 40.00}
{L 130.00 20.00 170.00 20.00 }
{L 0.00 40.00 30.00 40.00 }
{L 0.00 0.00 30.00 0.00 }
{R 30.00 -20.00 130.00 60.00 }
{Ly "DEVICE"}
{Tj "CC"}
{T "74LS00" 70.00 -30.00}
}
{ATR
{IN
{Ty 4}
}
}
}
{I 74ls00.sym UC00000000
{CN B D F}
{ATR
{IN
{PI 160.00 20.00}
}
}

```

```

{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{At PCL (1,1,"d","d") 70.00 -50.00}
}
}
}
{COMP_DEF 74ls04.sym
{PIN_DEF
[Ly "PINCON"]
{P OUTY {Pt "OUTPUT"}{Lq 0}{Ploc 130.00 0.00}}
{P INA {Pt "INPUT"}{Lq 0}{Ploc 0.00 0.00}}
}
{PKG
[Ly "REFDES"]
[Ts 25.00][Tj "LC"][Tr 0][Tm "N"]
{Rdl 50.00 40.00}

[Ly "PINNUM"]
[Ts 15.00]
{Pnl 120.00 10.00}
[Tj "RC"]
{Pnl 20.00 10.00}

{Pid 74LS04 }
{Sd A 2 1}
{Sd B 4 3}
{Sd C 6 5}
{Sd D 8 9}
{Sd E 10 11}
{Sd F 12 13}
}

{PIC
[Ly "GATE"]
[LS "SOLID"][Wd 0.00]
[Ts 15.00][Tj "RC"][Tr 0][Tm "N"]
{C 100.00 0.00 10.00 }
{L 30.00 0.00 0.00 0.00 }
{L 30.00 35.00 30.00 -35.00 90.00 0.00 30.00 35.00 }
{L 110.00 0.00 130.00 0.00 }
[Ly "IEEE"]
[Tj "CC"]
{T "1" 60.00 10.00}
{L 110.00 0.00 90.00 10.00 }
{L 90.00 0.00 130.00 0.00 }
{R 30.00 -35.00 90.00 35.00 }
{L 30.00 0.00 0.00 0.00 }
[Ly "DEVICE"]
{T "74LS04" 60.00 -50.00}
}
{ATR
{IN
{Ty 1}
}
}
}
{I 74ls04.sym XC00001
{CN G E}
{ATR
{IN
{PI 170.00 -60.00}
{Un "Y"}
}
}

```

```

{EX
[Ly "ATTR"]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{At PCL (1,1,"D","D") 60.00 -50.00}
}
}
}
{COMP_DEF ex2.sym
{PIN_DEF
[Ly "PINCON"]
{P INP {Pt "INPUT"}{Lq 0}{Ploc 0.00 0.00}}
{P Q {Pt "OUTPUT"}{Lq 0}{Ploc 180.00 0.00}}
{P Q' {Pt "OUTPUT"}{Lq 0}{Ploc 180.00 -40.00}}
}

{PIC
[Ly "GATE"]
[Ls "SOLID"][Wd 0.00]
[Ts 10.00][Tj "CC"][Tr 0][Tm "N"]
{L 150.00 0.00 180.00 0.00 }
{L 150.00 -40.00 180.00 -40.00 }
{R 30.00 -60.00 150.00 20.00 }
{L 0.00 0.00 30.00 0.00 }
[Ly "PINNAM"]
[Ts 15.00]
{T "INP" 50.00 0.00}
{T "Q" 130.00 0.00}
{T "Q'" 130.00 -40.00}
[Ly "DEVICE"]
{T "EX2" 90.00 -20.00}
}
{ATR
{IN
{Ty 256}
}
}
}
{I ex2.sym XC00003
{CN A B C}
{ATR
{IN
{PI -300.00 60.00}
{Un "Y"}
}
}
}
{I ex2.sym XC00002
{CN C D E}
{ATR
{IN
{PI -60.00 20.00}
{Un "Y"}
}
}
}
}
}
}
}
}
}

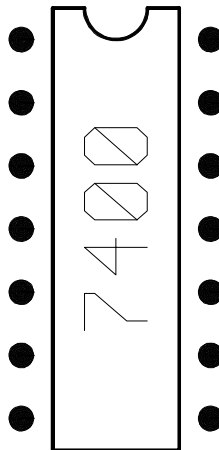
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## PCB Part 7400A

Part File:

7400a.prt



PDIF File:

7400a.pdf

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%*****
% Program   : pdifout VERSION 8.5                *
% Date      : Aug 15 1994                        *
% Time      : 04:31:56 PM                        *
% File In   : 7400a.prt                          *
% File Out  : 7400a.pdf                          *
% Format    : P-CAD DATABASE INTERCHANGE FORMAT  *
%*****
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{COMPONENT 7400a.prt
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{ENVIRONMENT
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{Program "pdifout Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994    5:44 p.m.    "}
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 8 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9 "FLINT" 9
"GNDCON" 10 "FLGCON" 10 "GNDCLR" 12 "FLGCLR" 12 "PWRCLR" 13
"FLPCLR" 13 "SLDMSK" 14 "FLSMSK" 14 "DRILL" 15 "FLDRLL" 15 "PIN" 4
"BRDOUT" 4 "FLTARG" 4 "SLKSCR" 6 "DEVICE" 5 "ATTR" 6 "REFDES" 6
"COMP" 1 "SOLDER" 2 "INT1" 3 "FLCLER" 12 "CLEAR" 12 "PWRCON" 13
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```

"FLPCON" 13 "ANNOT" 5 "$$NULL" 0}
{Lyrphid 22 22 22 23 23 23 24 24 24 25 25 25}
{Ssymtbl 0 -1 126 126}
{PCLR 0.00}
{PSIZ 0.00}
{Polyap 0.00}
{ROTP 0.00}
}

{USER
{VIEW
{Mode SYMB}
{Vw 200.00 -300.00 4.00 1 -366.00 -485.00 1866.00 1085.00
2 242.00 -42.00 1358.00 742.00}
{Lv 31 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 2 0 1 2 0 0 2 2 0 0 0 0 0 2}
{Gs 50.00 50.00}
{RCTL 0 0 0}
}
}

{DISPLAY
[Ly "ANNOT"]
[LS "SOLID"] [Wd 5.00]
[TS 125.00] [Tj "CC"] [Tr 1] [Tm "N"]
}

{APERTURE_TABLE
{Apver 2.0}
}

{SYMBOL
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[Ly "PIN"]
{P 1 {Pt 1}{Lq 1}{Ploc 0.00 0.00}}
{P 2 {Pt 2}{Lq 1}{Ploc 0.00 -100.00}}
{P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
{P 4 {Pt 2}{Lq 2}{Ploc 0.00 -300.00}}
{P 5 {Pt 2}{Lq 2}{Ploc 0.00 -400.00}}
{P 6 {Pt 2}{Lq 0}{Ploc 0.00 -500.00}}
{P 7 {Pt 3}{Lq 0}{Ploc 0.00 -600.00}}
{P 8 {Pt 2}{Lq 0}{Ploc 300.00 -600.00}}
{P 9 {Pt 2}{Lq 3}{Ploc 300.00 -500.00}}
{P 10 {Pt 2}{Lq 3}{Ploc 300.00 -400.00}}
{P 11 {Pt 2}{Lq 0}{Ploc 300.00 -300.00}}
{P 12 {Pt 2}{Lq 4}{Ploc 300.00 -200.00}}
{P 13 {Pt 2}{Lq 4}{Ploc 300.00 -100.00}}
{P 14 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
}
{SPKG
{Sna A B C D}
{Sp INA 1 4 9 12}
{Sp INB 2 5 10 13}
{Sp OUTY 3 6 8 11}
}

{PIC
[Ly "SLKSCR"]
[LS "SOLID"] [Wd 5.00]
[TS 125.00] [Tj "CC"] [Tr 1] [Tm "N"]
{L 200.00 50.00 250.00 50.00 250.00 -650.00 50.00 -650.00 50.00 50.00

```

```

100.00 50.00 }
{Arc 150.00 50.00 100.00 50.00 200.00 50.00}
[Ly "DEVICE"]
{T "7400" 150.00 -300.00}
}

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{ATR
{IN
{Org 0.00 0.00}
{Ty 10000}
}
}
}

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{DETAIL
{ANNOTATE
}

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{NET_DEF
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{ATR
{IN
{Rats "OFF"}
}
}
}
{N 2
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 3
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 4
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 5
{ATR
{IN
{Rats "OFF"}
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}
}
{N 6
{ATR
{IN
{Rats "OFF"}
}
}
}

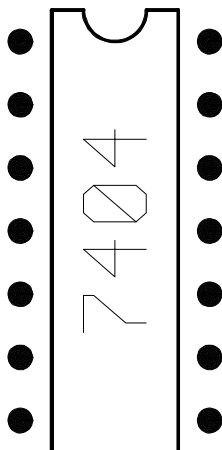
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{N 7  
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{IN  
{Rats "OFF"}  
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}  
{N 8  
{ATR  
{IN  
{Rats "OFF"}  
}  
}  
}  
{N 9  
{ATR  
{IN  
{Rats "OFF"}  
}  
}  
}  
{N 10  
{ATR  
{IN  
{Rats "OFF"}  
}  
}  
}  
{N 11  
{ATR  
{IN  
{Rats "OFF"}  
}  
}  
}  
{N 12  
{ATR  
{IN  
{Rats "OFF"}  
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}  
}  
{N 13  
{ATR  
{IN  
{Rats "OFF"}  
}  
}  
}  
{N 14  
{ATR  
{IN  
{Rats "OFF"}  
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}  
}
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}  
{PAD_STACK  
{SUBCOMP  
}  
}
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PCB Part: 7404T

Part File: 7404t.prt



PDIF File: 7404t.pdf

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% Date : Aug 15 1994 *
% Time : 04:31:49 PM *
% File In : 7404.prt *
% File Out : 7404t.pdf *
% Format : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

{COMPONENT 7404t.prt{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 5:44 p.m. "}
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 7 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9 "FLINT" 9
"GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12 "PWRCON" 13 "FLPCON" 13
"SLDMSK" 14 "FLSMSK" 14 "DRILL" 15 "FLDRLL" 15 "PIN" 4 "BRDOUT" 4
"FLTARG" 4 "SLKSCR" 6 "DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1
"SOLDER" 2 "INT1" 14 "INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4
"PINBOT" 3 "MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
"PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5 "DVCTOP" 1
"DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "$$NULL" 0}
```

```

(Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30 29 126
31 32 126 32 31 126 33 34 126 34 33 126 35 36 126 36 35 126 37 38 126
38 37 126 39 40 126 40 39 126 41 42 126 42 41 126 43 44 126 44 43 126)
{Ssymtbl 0 -1 126 126}
{PCLR 0.00}
{PSIZ 0.00}
{Polyap 0.00}
{ROTP 0.00}
}

{USER
{VIEW
{Mode SYMB}
{Vw 250.00 -300.00 4.00 1 -366.00 -485.00 1866.00 1085.00
2 242.00 -42.00 1358.00 742.00}
{Lv 20 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 2 0 2 2 0 0 2 2 0 0 0 0 1 1 0
0 0 0 0 0 0 0 1 1 1 1 1 1}
{Gs 50.00 50.00}
{RCTL 0 0 0}
}
}

{DISPLAY
[Ly "SLKSCR"]
[Ls "SOLID"] [Wd 5.00]
[Ts 125.00] [Tj "CC"] [Tr 1] [Tm "N"]
}

{APERTURE_TABLE
{Apver 2.0}
}

{SYMBOL
{PIN_DEF
[Ly "PIN"]
{P 1 {Pt 1}{Lq 0}{Ploc 0.00 0.00}}
{P 21 {Pt 2}{Lq 0}{Ploc 0.00 -100.00}}
{P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
{P 4 {Pt 2}{Lq 0}{Ploc 0.00 -300.00}}
{P 5 {Pt 2}{Lq 0}{Ploc 0.00 -400.00}}
{P 6 {Pt 2}{Lq 0}{Ploc 0.00 -500.00}}
{P 7 {Pt 3}{Lq 0}{Ploc 0.00 -600.00}}
{P 8 {Pt 2}{Lq 0}{Ploc 300.00 -600.00}}
{P 9 {Pt 2}{Lq 0}{Ploc 300.00 -500.00}}
{P 10 {Pt 2}{Lq 0}{Ploc 300.00 -400.00}}
{P 11 {Pt 2}{Lq 0}{Ploc 300.00 -300.00}}
{P 12 {Pt 2}{Lq 0}{Ploc 300.00 -200.00}}
{P 13 {Pt 2}{Lq 0}{Ploc 300.00 -100.00}}
{P 14 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
}

{PIC
[Ly "SLKSCR"]
[Ls "SOLID"] [Wd 5.00]
[Ts 125.00] [Tj "CC"] [Tr 1] [Tm "N"]
{Arc 150.00 50.00 100.00 50.00 200.00 50.00}
{L 200.00 50.00 250.00 50.00 250.00 -650.00 50.00 -650.00 50.00 50.00
100.00 50.00}
[Ly "DEVICE"]
{T "7404" 150.00 -300.00}
}

{ATR
{IN
{Org 0.00 0.00}

```

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{Ty 10000}
}
}
}

{DETAIL
{ANNOTATE
}

{NET_DEF
{N 1
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 21
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 3
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 4
{ATR
{IN
{Rats "OFF"}
}
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}
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}
}
}
{N 6
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 7
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{IN
{Rats "OFF"}
}
}
}
}
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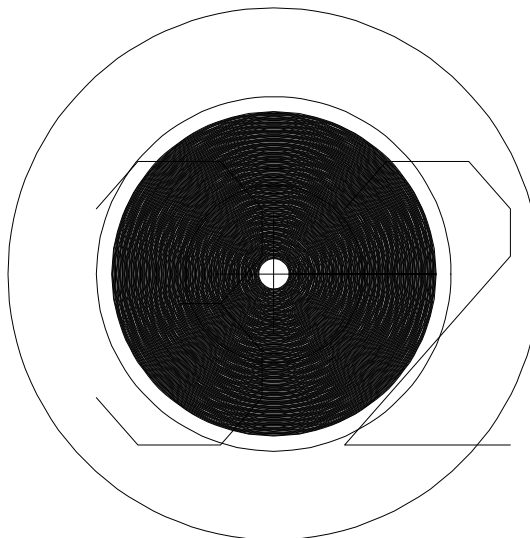


```
{N 8
{ATR
{IN
{Rats "OFF"}
}
}
}
{N 9
{ATR
{IN
{Rats "OFF"}
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}
}
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{N 13
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}
}
}
{N 14
{ATR
{IN
{Rats "OFF"}
}
}
}
}
{PAD_STACK
}

{SUBCOMP
}
}
}
```

Padstack: C60R32

Padstack File: c60r32.ps



PDIF File: c60r32.pdf

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% Program : pdifout VERSION 8.5 *
% Date : Aug 15 1994 *
% Time : 04:32:34 PM *
% File In : c60r32.ps *
% File Out : c60r32.pdf *
% Format : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

{COMPONENT c60r32.ps

{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 2:42 p.m." }
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 7 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9 "FLINT" 9
"GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12 "PWRCON" 13 "FLPCON" 13
"SLDMSK" 14 "FLSMSK" 14 "DRILL" 15 "FLDRLL" 15 "PIN" 4 "BRDOUT" 4
"FLTARG" 4 "SLKSCR" 6 "DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1
"SOLDER" 2 "INT1" 14 "INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4
"PINBOT" 3 "MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
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```

"PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5 "DVCTOP" 1
"DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "$$NULL" 0}
{Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30 29 126
31 32 126 32 31 126 33 34 126 34 33 126 35 36 126 36 35 126 37 38 126
38 37 126 39 40 126 40 39 126 41 42 126 42 41 126 43 44 126 44 43 126}
{Ssymtbl 0 -1 126 126}
{PCLR 10.00}
{PSIZ 0.00}
{Polyap 0.00}
{ROTP 0.00}
}

{USER
{VIEW
{Mode SYMB}
{Vw 1825.00 1578.00 0.50}
{Lv 2 2 2 0 0 0 0 0 0 0 0 0 2 2 2 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0}
{Gs 5.00 5.00}
{RCTL 0 0 0}
}
}

{DISPLAY
[Ly "FLCOMP"]
[Ls "SOLID"][Wd 25.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
}

{APERTURE_TABLE
{Apver 2.0}
}

{SYMBOL
{PIN_DEF
}

{PIC
[Ly "FLDRLL"]
[Ls "SOLID"][Wd 25.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{Fl 1825.00 1580.00 23 0}
[Ly "FLSMK"]
{Fl 1825.00 1580.00 19 0}
[Ly "FLCOMP"]
{Fl 1825.00 1580.00 17 0}
[Ly "SLDMSK"]
[Wd 0.00]
{C 1825.00 1580.00 45.00 }
[Ly "DRILL"]
{T "32" 1830.00 1575.00}
{L 1825.00 1590.00 1825.00 1570.00 }
{L 1815.00 1580.00 1835.00 1580.00 }
[Ly "PADCOM"]
{C 1825.00 1580.00 30.00 }
[Ly "PIN"]
[Wd 25.00]
{C 1825.00 1580.00 15.00 }
}

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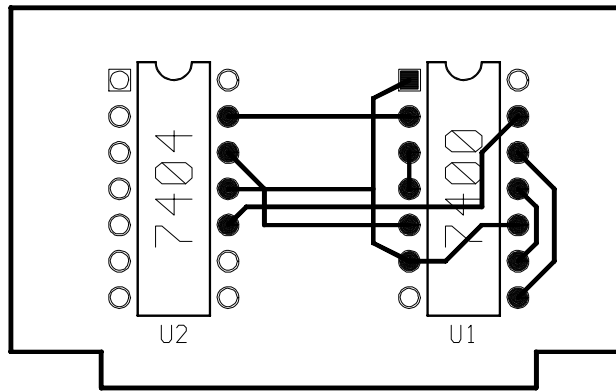
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{ATR
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{Org 1825.00 1580.00}
{Ty 255}
}
}
}
```

```
{DETAIL
{ANNOTATE
}
```

```
{NET_DEF
}
```

```
{PAD_STACK
}
```

```
{SUBCOMP
}
}
}
```

**PCB Design: EX4****PCB File: ex4.pcb**

EX4.PCB

**PDIF File: ex4.pdf**

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%*****
% Program : pdifout VERSION 8.5 *
% Date : Aug 15 1994 *
% Time : 04:28:56 PM *
% File In : ex4.pcb *
% File Out : ex4.pdf *
% Format : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

{COMPONENT ex4.pcb

{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 4:24 p.m."}
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 14 "FLCOMP" 7 "PADSLD" 8 "FLSOLD" 8 "PADINT" 9 "FLINT" 9
"GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12 "PWRCON" 13 "FLPCON" 13
"SLDMSK" 14 "FLSMSK" 14 "DRILL" 15 "FLDRLL" 15 "PIN" 4 "BRDOUT" 4
"FLTARG" 4 "SLKSCR" 6 "DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1
"SOLDER" 2 "INT1" 14 "INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4
```

```

"PINBOT" 3 "MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
"PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5 "DVCTOP" 1
"DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "$$NULL" 0}
{Ssymtbl 0 -1 126 126}
{Lyrphid 23 23 23 24 24 24 25 25 25 26 26 26 29 30 126 30 29 126
31 32 126 32 31 126 33 34 126 34 33 126 35 36 126 36 35 126 37 38 126
38 37 126 39 40 126 40 39 126 41 42 126 42 41 126 43 44 126 44 43 126}
{PCLR 10.00}
{PSIZ 0.00}
{Polyap 0.00}
{ROTP 0.00}
{SSTfile temp.ssf }
}

{USER
{VIEW
{Mode DETL}
{Vw 750.00 300.00 4.00}
{Lv 24 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 2 0 1 2 0 0 2 2 0 0 0 0 0 1 0
0 0 0 0 0 0 1 1 1 1 1 1}
{Gs 50.00 50.00}
{RCTL 0 0 0}
}
}

{DISPLAY
[Ly "COMP"]
[LS "SOLID"][Wd 5.00]
[TS 60.00][Tj "CC"][Tr 0][Tm "N"]
[Dwd 0.00][Dts 0.00][Dafd 0]
[Cent 0.00][Elf 0.00][Eba 0.00]
[Dli 0.00][Dtl 0][Dpt 0.00][Dmt 0.00]
[Dtd 0][Dor 0][Dlt 0][Lss 0.00][Ddt 0]
[Gdt 0][Apt 0.00][Amt 0.00][Ds 0][Ddu 0][Dus 0]
[Afn ""]
[Mas 0.00][Pfc 0.00]
}

{APERTURE_TABLE
{Apfile temp.apr }
{Apver 2.0}
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{Shp ROUND}
{Dcode 10}
{Odia 5.00}
{Aptype LINE}
}
{Aprnum 2
{Shp ROUND}
{Dcode 11}
{Odia 8.00}
{Aptype LINE}
}
{Aprnum 3
{Shp ROUND}
{Dcode 12}
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{Aptype LINE}
}
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{Shp ROUND}
{Dcode 13}
{Odia 12.00}
{Aptype LINE}
}
}

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{Shp ROUND}
{Dcode 14}
{Odia 25.00}
{Aptype LINE}
}
{Aprnum 6
{Shp ROUND}
{Dcode 15}
{Odia 50.00}
{Aptype LINE}
}
{Aprnum 7
{Shp ROUND}
{Dcode 16}
{Odia 75.00}
{Aptype LINE}
}
{Aprnum 8
{Shp ROUND}
{Dcode 17}
{Odia 100.00}
{Aptype LINE}
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{Aprnum 9
{Shp SQUARE}
{Dcode 18}
{Owd 70.00}
{Aprot 0}
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{Aprnum 10
{Shp SQUARE}
{Dcode 19}
{Owd 60.00}
{Aprot 0}
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{Aprnum 11
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{Dcode 70}
{Odia 60.00}
{Aptype FLASH}
}
{Aprnum 12
{Shp RECTANGLE}
{Dcode 71}
{Owd 60.00}
{Oht 60.00}
{Aprot 0}
{Aptype FLASH}
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{Aprnum 13
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{Dcode 20}
{Odia 75.00}
{Aptype FLASH}
}
{Aprnum 14
{Shp RECTANGLE}
{Dcode 21}
{Owd 75.00}
{Oht 75.00}
{Aprot 0}
{Aptype FLASH}
}
{Aprnum 15
{Shp ROUND}
{Dcode 22}
{Odia 50.00}
{Aptype FLASH}
}
{Aprnum 16
{Shp RECTANGLE}
{Dcode 23}
{Owd 80.00}
{Oht 80.00}
{Aprot 0}
{Aptype FLASH}
}
{Aprnum 17
{Shp ROUND}
{Dcode 24}
{Odia 60.00}
{Aptype FLASH}
}
{Aprnum 18
{Shp RECTANGLE}
{Dcode 25}
{Owd 90.00}
{Oht 90.00}
{Aprot 0}
{Aptype FLASH}
}
{Aprnum 19
{Shp ROUND}
{Dcode 26}
{Odia 70.00}
{Aptype FLASH}
}
{Aprnum 20
{Shp RECTANGLE}
{Dcode 27}
{Owd 100.00}
{Oht 100.00}
{Aprot 0}
{Aptype FLASH}
}
```



```

{Aprnum 21
{Shp ROUND}
{Dcode 28}
{Odia 125.00}
{Aptype FLASH}
}
{Aprnum 22
{Shp RECTANGLE}
{Dcode 29}
{Owd 125.00}
{Oht 125.00}
{Aprot 0}
{Aptype FLASH}
}
{Aprnum 23
{Shp TARGET}
{Dcode 72}
{Odia 60.00}
{Apcomm "5 mil cross hairs"}
{Aptype FLASH}
}
{Aprnum 24
{Shp TARGET}
{Dcode 73}
{Odia 50.00}
{Apcomm "5 mil cross hairs"}
{Aptype FLASH}
}
}

{SYMBOL
{PIN_DEF
}

{PIC
}

{ATR
{IN
{Org -21474836.47 -21474836.47}
{Ty 255}
}
}

{DETAIL
{ANNOTATE
{Ly "BRDOUT"}
{Ls "SOLID"}[Wd 5.00]
{Ts 60.00}[Tj "CC"][Tr 0][Tm "N"]
{T "EX4.PCB" 710.00 -302.00}
{Wd 12.00}
{L -150.00 850.00 1550.00 850.00 1550.00 -100.00 1300.00 -100.00
1300.00 -200.00 100.00 -200.00 100.00 -100.00 -150.00 -100.00
-150.00 850.00 }
}

{NET_DEF
{N XN00000000
{DG
{Ly "SOLDER"}
{Ls "SOLID"}[Wd 12.00]
{Ts 60.00}[Tj "CC"][Tr 0][Tm "N"]
{W 950.00 650.00 850.00 600.00 850.00 200.00 950.00 150.00 1050.00 150.00
1150.00 250.00 1250.00 250.00 }
}

```

```
[Ly "COMP"]
{W 850.00 350.00 450.00 350.00 }
{V 850.00 350.00 0}
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000001
{DG
[Ly "COMP"]
[Ls "SOLID"][Wd 12.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{W 550.00 250.00 950.00 250.00 }
{V 550.00 250.00 0}
[Ly "SOLDER"]
{W 450.00 450.00 550.00 350.00 550.00 250.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000002
{DG
[Ly "COMP"]
[Ls "SOLID"][Wd 12.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{W 450.00 550.00 950.00 550.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000003
{DG
[Ly "SOLDER"]
[Ls "SOLID"][Wd 12.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{W 1250.00 350.00 1300.00 300.00 1300.00 200.00 1250.00 150.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
```

```

{N XN00000004
{DG
{Ly "SOLDER"}
{Ls "SOLID"}[Wd 12.00]
{Ts 60.00}[Tj "CC"]{Tr 0}[Tm "N"]
{W 1250.00 450.00 1350.00 350.00 1350.00 150.00 1250.00 50.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000005
{DG
{Ly "COMP"}
{Ls "SOLID"}[Wd 12.00]
{Ts 60.00}[Tj "CC"]{Tr 0}[Tm "N"]
{W 1150.00 300.00 500.00 300.00 450.00 250.00 }
{V 1150.00 300.00 0}
{Ly "SOLDER"}
{W 1250.00 550.00 1150.00 450.00 1150.00 300.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000006
{DG
{Ly "SOLDER"}
{Ls "SOLID"}[Wd 12.00]
{Ts 60.00}[Tj "CC"]{Tr 0}[Tm "N"]
{W 950.00 450.00 950.00 350.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000007
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000008
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000009

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```
{ATR
{IN
{Rats "OFF"}
}
}
{N XN00000010
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000011
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000012
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000013
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000014
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000015
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000016
{ATR
{IN
{Rats "OFF"}
}
}
}
{N XN00000017
{ATR
```

```

{IN
{Rats "OFF"}
}
}
}
}

{PAD_STACK
{Pad 0 "v50r28.ps"}
{Pad 1 "c60s32.ps" "n60s32.ps"}
{Pad 2 "c60r32.ps" "n60r32.ps"}
{Pad 3 "c60r32.ps" "n60r32.ps"}
{Pad 4 "c60r32.ps" "n60r32.ps"}
{Pad 5 "c60r32.ps" "n60r32.ps"}
{PAD_DEF v50r28.ps
{ATR
{IN
{Org 0.00 0.00}
{Ty 255}
}
}

{PIC
[Ly "SLDMSK"]
[Ls "SOLID"][Wd 0.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{C 0.00 0.00 40.00 }
[Ly "FLDRLL"]
{Fl 0.00 0.00 24 0}
[Ly "FLCOMP"]
{Fl 0.00 0.00 15 0}
[Ly "FLSMSK"]
{Fl 0.00 0.00 17 0}
[Ly "DRILL"]
{T "28" -5.00 -5.00}
{L -10.00 0.00 10.00 0.00 }
{L 0.00 10.00 0.00 -10.00 }
[Ly "PADINT"]
{C 0.00 0.00 25.00 }
}
}

{PAD_DEF c60s32.ps
{ATR
{IN
{Org 0.00 0.00}
{Ty 255}
}
}

{PIC
[Ly "PADCOM"]
[Ls "SOLID"][Wd 0.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{R -30.00 -30.00 30.00 30.00 }
[Ly "SLDMSK"]
{C 0.00 0.00 45.00 }
[Ly "FLSMSK"]
{Fl 0.00 0.00 9 0}
[Ly "FLDRLL"]

```

```
{Fl 0.00 0.00 23 0}
[Ly "FLCOMP"]
{Fl 0.00 0.00 10 0}
[Ly "DRILL"]
{T "32" -5.00 -5.00}
{L 0.00 10.00 0.00 -10.00 }
{L -10.00 0.00 10.00 0.00 }
[Ly "PIN"]
{Fr -25.00 -25.00 25.00 25.00 }
}
}
{PAD_DEF n60s32.ps
{ATR
{IN
{Org 0.00 0.00}
{Ty 255}
}
}
```

```
{PIC
[Ly "PADCOM"]
[LS "SOLID"][Wd 0.00]
[TS 60.00][Tj "CC"][Tr 0][Tm "N"]
{R -30.00 -30.00 30.00 30.00 }
[Ly "FLSMASK"]
{Fl 0.00 0.00 9 0}
[Ly "FLDRLL"]
{Fl 0.00 0.00 23 0}
[Ly "FLCOMP"]
{Fl 0.00 0.00 10 0}
[Ly "DRILL"]
{T "32" -5.00 -5.00}
{L 0.00 10.00 0.00 -10.00 }
{L -10.00 0.00 10.00 0.00 }
[Ly "SLDMSK"]
{C 0.00 0.00 45.00 }
[Ly "PIN"]
{C 0.00 0.00 25.00 }
}
}
{PAD_DEF c60r32.ps
{ATR
{IN
{Org 0.00 0.00}
{Ty 255}
}
}
```

```
{PIC
[Ly "FLDRLL"]
[LS "SOLID"][Wd 0.00]
[TS 60.00][Tj "CC"][Tr 0][Tm "N"]
{Fl 0.00 0.00 23 0}
[Ly "FLSMASK"]
{Fl 0.00 0.00 19 0}
[Ly "FLCOMP"]
{Fl 0.00 0.00 17 0}
[Ly "SLDMSK"]
{C 0.00 0.00 45.00 }
[Ly "DRILL"]
{T "32" 5.00 -5.00}
{L 0.00 10.00 0.00 -10.00 }
{L -10.00 0.00 10.00 0.00 }
[Ly "PADCOM"]
{C 0.00 0.00 30.00 }
```

```

[Ly "PIN"]
[Wd 25.00]
{C 0.00 0.00 15.00 }
}
}
{PAD_DEF n60r32.ps
{ATR
{IN
{Org 0.00 0.00}
{Ty 255}
}
}
}

{PIC
[Ly "FLCOMP"]
[Ls "SOLID"][Wd 25.00]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{Fl 0.00 0.00 17 0}
[Ly "FLSMK"]
{Fl 0.00 0.00 19 0}
[Ly "FLDRLL"]
{Fl 0.00 0.00 23 0}
[Ly "PADCOM"]
[Wd 0.00]
{C 0.00 0.00 30.00 }
[Ly "SLDMSK"]
{C 0.00 0.00 45.00 }
[Ly "DRILL"]
{T "32" -5.00 -5.00}
{L 0.00 10.00 0.00 -10.00 }
{L -10.00 0.00 10.00 0.00 }
[Ly "PIN"]
{C 0.00 0.00 25.00 }
}
}
}

{SUBCOMP
{COMP_DEF 7400a.prt
{PIN_DEF
[Ly "PIN"]
{P 1 {Pt 1}{Lq 1}{Ploc 0.00 0.00}}
{P 2 {Pt 2}{Lq 1}{Ploc 0.00 -100.00}}
{P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
{P 4 {Pt 2}{Lq 2}{Ploc 0.00 -300.00}}
{P 5 {Pt 2}{Lq 2}{Ploc 0.00 -400.00}}
{P 6 {Pt 2}{Lq 0}{Ploc 0.00 -500.00}}
{P 7 {Pt 3}{Lq 0}{Ploc 0.00 -600.00}}
{P 8 {Pt 2}{Lq 0}{Ploc 300.00 -600.00}}
{P 9 {Pt 2}{Lq 3}{Ploc 300.00 -500.00}}
{P 10 {Pt 2}{Lq 3}{Ploc 300.00 -400.00}}
{P 11 {Pt 2}{Lq 0}{Ploc 300.00 -300.00}}
{P 12 {Pt 2}{Lq 4}{Ploc 300.00 -200.00}}
{P 13 {Pt 2}{Lq 4}{Ploc 300.00 -100.00}}
{P 14 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
}
{SPKG
{Sna A B C D}
{Sp INA 1 4 9 12}
{Sp INB 2 5 10 13}
{Sp OUTY 3 6 8 11}
}
}

{PIC
[Ly "SLKSCR"]

```

```

[Ls "SOLID"] [Wd 5.00]
[Ts 60.00][Tj "CC"] [Tr 0][Tm "N"]
{Arc 150.00 50.00 100.00 50.00 200.00 50.00}
{L 200.00 50.00 250.00 50.00 250.00 -650.00 50.00 -650.00 50.00 50.00
100.00 50.00 }
[Ly "DEVICE"]
[Ts 125.00][Tr 1]
{T "7400" 150.00 -300.00}
}
{ATR
{IN
{Ty 10000}
}
}
}
{I 7400a.prt U1
{CN XN00000009 XN00000002 XN00000010 XN00000011 XN00000001
XN00000007 ? XN00000012 XN00000013 XN00000014 XN00000015
XN00000016 XN00000017 ?}
{ATR
{IN
{PI 950.00 650.00}
[Ly "DEVICE"]
[Ts 60.00][Tj "CC"] [Tr 0][Tm "N"]
{NI 150.00 -700.00}
}
}
}
{COMP_DEF 7404t.prt
{PIN_DEF
[Ly "PIN"]
{P 1 {Pt 1}{Lq 0}{Ploc 0.00 0.00}}
{P 21 {Pt 2}{Lq 0}{Ploc 0.00 -100.00}}
{P 3 {Pt 2}{Lq 0}{Ploc 0.00 -200.00}}
{P 4 {Pt 2}{Lq 0}{Ploc 0.00 -300.00}}
{P 5 {Pt 2}{Lq 0}{Ploc 0.00 -400.00}}
{P 6 {Pt 2}{Lq 0}{Ploc 0.00 -500.00}}
{P 7 {Pt 3}{Lq 0}{Ploc 0.00 -600.00}}
{P 8 {Pt 2}{Lq 0}{Ploc 300.00 -600.00}}
{P 9 {Pt 2}{Lq 0}{Ploc 300.00 -500.00}}
{P 10 {Pt 2}{Lq 0}{Ploc 300.00 -400.00}}
{P 11 {Pt 2}{Lq 0}{Ploc 300.00 -300.00}}
{P 12 {Pt 2}{Lq 0}{Ploc 300.00 -200.00}}
{P 13 {Pt 2}{Lq 0}{Ploc 300.00 -100.00}}
{P 14 {Pt 4}{Lq 0}{Ploc 300.00 0.00}}
}
}

{PIC
[Ly "SLKSCR"]
[Ls "SOLID"] [Wd 5.00]
[Ts 60.00][Tj "CC"] [Tr 0][Tm "N"]
{L 200.00 50.00 250.00 50.00 250.00 -650.00 50.00 -650.00 50.00 50.00
100.00 50.00 }
{Arc 150.00 50.00 100.00 50.00 200.00 50.00}
[Ly "DEVICE"]
[Ts 125.00][Tr 1]
{T "7404" 150.00 -300.00}
}
{ATR
{IN
{Ty 10000}
}
}
}
{I 7404t.prt U2

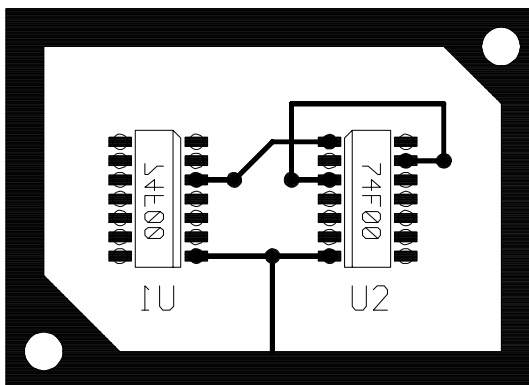
```



```
{CN ? ? ? ? ? ? ? ? XN00000005 XN00000000 XN00000008
XN00000002 ?}
{ATR
{IN
{PI 150.00 650.00}
[Ly "DEVICE"]
[Ts 60.00][Tj "CC"][Tr 0][Tm "N"]
{NI 150.00 -700.00}
}
}
}
}
}
```

## PCB Design Using Surface Mount Devices

PCB File: **pdifex.pcb**



PDIF File: **pdifex.pdf**

```
%*****
% Program : pdifout VERSION 8.5 *
% Date : Aug 15 1994 *
% Time : 04:27:56 PM *
% File In : pdifex.pcb *
% File Out : pdifex.pdf *
% Format : P-CAD DATABASE INTERCHANGE FORMAT *
%*****

(COMMENT pdifex.pcb)

{ENVIRONMENT
{PDIFvrev 8.5}
{Program "pdifout Version 8.5"}
{DBtype "PC-Board"}
{DBvrev 2.09}
{DBtime "Aug. 15, 1994 4:23 p.m."}
{DBunit "CENTIMIL"}
{DBgrid 1}
{Lyrstr "PADCOM" 1 "FLCOMP" 7 "PADSLD" 2 "FLSOLD" 8 "PADINT" 9 "FLINT" 9
"GNDCON" 10 "FLGCON" 10 "CLEAR" 12 "FLCLER" 12 "PWRCON" 13 "FLPCON" 13
"SLDMSK" 14 "FLSMSK" 14 "DRILL" 15 "FLDRLL" 15 "PIN" 4 "BRDOUT" 4
"FLTARG" 4 "SLKSCR" 6 "DEVICE" 5 "ATTR" 6 "REFDES" 6 "COMP" 1
"SOLDER" 2 "INT1" 14 "INT2" 6 "DRLGIN" 5 "DRLFIN" 6 "PINTOP" 4
"PINBOT" 3 "MSKGTP" 13 "MSKGBT" 14 "MSKFTP" 8 "MSKFBT" 9 "PSTGTP" 1
"PSTGBT" 2 "PSTFTP" 12 "PSTFBT" 13 "SLKTOP" 6 "SLKBOT" 5 "DVCTOP" 1
"DVCBOT" 2 "REFDTP" 3 "REFDBT" 6 "PADVIA" 9 "PAD51" 1 "PAD52" 2 "$$NULL" 0}
{Lyrphid 0 2 126 1 3 126 2 0 126 3 1 126 23 23 23 24 24 24 25 25 25
26 26 26 29 30 126 30 29 126 31 32 126 32 31 126 33 34 126 34 33 126
35 36 126 36 35 126 37 38 126 38 37 126 39 40 126 40 39 126 41 42 126}
```

```

42 41 126 43 44 126 44 43 126}
{Ssymtbl 0 -1 126 126 51 -2 24 26 52 -2 23 25}
{PCLR 10.00}
{PSIZ 0.00}
{Polyap 0.00}
{ROTP 0.00}
}

{USER
{VIEW
{Mode DETL}
{Vw 0.00 50.00 4.00 1 -1116.00 -735.00 1116.00 835.00}
{Lv 20 1 0 1 0 0 0 2 0 0 0 0 0 0 1 1 1 0 0 2 2 0 0 2 2 2 0 0 1 1 0
0 0 0 0 0 0 1 1 1 1 1 1 2 2 2}
{Gs 50.00 50.00}
{RCTL 0 0 0}
}
}

{DISPLAY
[Ly "SLKSCR"]
[Ls "SOLID"][Wd 12.00]
[Ts 80.00][Tj "CC"][Tr 0][Tm "N"]
[Dwd 0.00][Dts 0.00][Dafd 0]
[Cent 0.00][Elf 0.00][Eba 0.00]
[Dli 0.00][Dtl 0][Dpt 0.00][Dmt 0.00]
[Dtd 0][Dor 0][Dlt 0][Lss 0.00][Ddt 0]
[Gdt 0][Apt 0.00][Amt 0.00][Ds 0][Ddu 0][Dus 0]
[Afn ""]
[Mas 0.00][Pfc 0.00]
}

{APERTURE_TABLE
{Apver 2.0}
}

{SYMBOL
{PIN_DEF
}

{PIC
}

{ATR
{IN
{Org -21474836.47 -21474836.47}
{Ty 255}
}
}
}

{DETAIL
{ANNOTATE
}

```

```

{NET_DEF
{N N1
{DG
{Ly "SLKSCR"}
{Ls "SOLID"}[Wd 12.00]
{Ts 80.00}[Tj "CC"][Tr 0][Tm "N"]
{V 0.00 -100.00 0}
{Ly "INT2"}
{Poly
{Polyap 0.00}
{OI 1 700.00 550.00 700.00 -450.00 -700.00 -450.00 -700.00 550.00 }
{Pv 450.00 450.00 600.00 300.00 600.00 -350.00 -400.00 -350.00
-600.00 -150.00 -600.00 450.00 }
{Cv 600.00 450.00 50.00 }
{Cv -600.00 -350.00 50.00 }
}
{W 0.00 -100.00 0.00 -350.00 }
{Ly "SOLDER"}
{W -200.00 -100.00 0.00 -100.00 }
{Ly "COMP"}
{W 0.00 -100.00 150.00 -100.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N B
{DG
{Ly "COMP"}
{Ls "SOLID"}[Wd 12.00]
{Ts 80.00}[Tj "CC"][Tr 0][Tm "N"]
{V -100.00 100.00 0}
{W -100.00 100.00 0.00 200.00 150.00 200.00 }
{Ly "SOLDER"}
{W -200.00 100.00 -100.00 100.00 }
}
{ATR
{IN
{Rats "OFF"}
}
}
}
{N A
{DG
{Ly "SOLDER"}
{Ls "SOLID"}[Wd 12.00]
{Ts 80.00}[Tj "CC"][Tr 0][Tm "N"]
{V 450.00 150.00 52}
{V 50.00 100.00 52}
{Ly "COMP"}
{W 450.00 150.00 350.00 150.00 }
{W 150.00 100.00 50.00 100.00 }
{Ly "INT1"}
{W 50.00 100.00 50.00 300.00 450.00 300.00 450.00 150.00 }
}

```

```

(ATR
{IN
{Rats "OFF"}
}
}
}
}

{PAD_STACK
}

{SUBCOMP
{COMP_DEF f00d.prt
{PIN_DEF
[Ly "PIN"]
{P 1 {Pt 25}{Lq 1}{Ploc 0.00 0.00}}
{P 2 {Pt 25}{Lq 1}{Ploc 0.00 -50.00}}
{P 3 {Pt 25}{Lq 0}{Ploc 0.00 -100.00}}
{P 4 {Pt 25}{Lq 2}{Ploc 0.00 -150.00}}
{P 5 {Pt 25}{Lq 2}{Ploc 0.00 -200.00}}
{P 6 {Pt 25}{Lq 0}{Ploc 0.00 -250.00}}
{P 7 {Pt 25}{Lq 0}{Ploc 0.00 -300.00}}
{P 8 {Pt 25}{Lq 0}{Ploc 200.00 -300.00}}
{P 9 {Pt 25}{Lq 3}{Ploc 200.00 -250.00}}
{P 10 {Pt 25}{Lq 3}{Ploc 200.00 -200.00}}
{P 11 {Pt 25}{Lq 0}{Ploc 200.00 -150.00}}
{P 12 {Pt 25}{Lq 4}{Ploc 200.00 -100.00}}
{P 13 {Pt 25}{Lq 4}{Ploc 200.00 -50.00}}
{P 14 {Pt 25}{Lq 0}{Ploc 200.00 0.00}}
}
{SPKG
{Sna A B C D}
{Sp OUTY 3 6 8 11}
{Sp INB 2 5 10 13}
{Sp INA 1 4 9 12}
}

{PIC
[Ly "SLKTOP"]
[LS "SOLID"] [Wd 0.00]
[TS 80.00] [Tj "CC"] [Tr 0] [Tm "N"]
{L 60.00 30.00 40.00 10.00 40.00 -330.00 160.00 -330.00 160.00 30.00
60.00 30.00 60.00 -330.00 }
[Ly "PINTOP"]
{Fr -35.00 -13.00 35.00 13.00 }
{Fr -35.00 -63.00 35.00 -37.00 }
{Fr -35.00 -113.00 35.00 -87.00 }
{Fr -35.00 -163.00 35.00 -137.00 }
{Fr -35.00 -213.00 35.00 -187.00 }
{Fr -35.00 -263.00 35.00 -237.00 }
{Fr -35.00 -313.00 35.00 -287.00 }
{Fr 165.00 -313.00 235.00 -287.00 }
{Fr 165.00 -263.00 235.00 -237.00 }
{Fr 165.00 -213.00 235.00 -187.00 }
{Fr 165.00 -163.00 235.00 -137.00 }
{Fr 165.00 -113.00 235.00 -87.00 }
{Fr 165.00 -63.00 235.00 -37.00 }
{Fr 165.00 -13.00 235.00 13.00 }
[Ly "PSTGTP"]
{Fr -35.00 -13.00 35.00 13.00 }
{Fr -35.00 -63.00 35.00 -37.00 }
{Fr -35.00 -113.00 35.00 -87.00 }
{Fr -35.00 -163.00 35.00 -137.00 }
{Fr -35.00 -213.00 35.00 -187.00 }
{Fr -35.00 -263.00 35.00 -237.00 }

```

```

{Fr -35.00 -313.00 35.00 -287.00 }
{Fr 165.00 -313.00 235.00 -287.00 }
{Fr 165.00 -263.00 235.00 -237.00 }
{Fr 165.00 -213.00 235.00 -187.00 }
{Fr 165.00 -163.00 235.00 -137.00 }
{Fr 165.00 -113.00 235.00 -87.00 }
{Fr 165.00 -63.00 235.00 -37.00 }
{Fr 165.00 -13.00 235.00 13.00 }
[Ly "MSKGTP"]
{Fr -40.00 -18.00 40.00 18.00 }
{Fr -40.00 -68.00 40.00 -32.00 }
{Fr -40.00 -118.00 40.00 -82.00 }
{Fr -40.00 -168.00 40.00 -132.00 }
{Fr -40.00 -218.00 40.00 -182.00 }
{Fr -40.00 -268.00 40.00 -232.00 }
{Fr -40.00 -318.00 40.00 -282.00 }
{Fr 160.00 -318.00 240.00 -282.00 }
{Fr 160.00 -268.00 240.00 -232.00 }
{Fr 160.00 -218.00 240.00 -182.00 }
{Fr 160.00 -168.00 240.00 -132.00 }
{Fr 160.00 -118.00 240.00 -82.00 }
{Fr 160.00 -68.00 240.00 -32.00 }
{Fr 160.00 -18.00 240.00 18.00 }
[Ly "DVCTOP"]
[Ts 60.00][Tr 3]
{T "74F00" 110.00 -155.00}
}
{ATR
{IN
{Ty 10500}
{Smd "Y"}
}
}
}
{I f00d.prt U2
{CN B ? A ? ? ? N1 ? ? ? ? A ?}
{ATR
{IN
{PI 150.00 200.00}
[Ly "SLKSCR"]
[Ts 80.00][Tj "CC"][Tr 0][Tm "N"]
{NI 100.00 -400.00}
}
}
{EX
[Ly "ATTR"]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
{At FP SOIC14 110.00 -320.00}
}
}
}
{I f00d.prt U1
{CN ? ? B ? ? ? N1 ? ? ? ? ? ?}
{ATR
{IN
{PI -200.00 200.00}
{Ps "B"}
[Ly "SLKSCR"]
[Ts 80.00][Tj "CC"][Tr 0][Tm "N"]
{NI -100.00 -400.00}
}
}
{EX
[Ly "ATTR"]
[Ts 15.00][Tj "CC"][Tr 0][Tm "N"]
{At FP SOIC14 -110.00 -320.00}
}
}

```

}  
}  
}  
}  
}

