CadPack

Import from C – LINK

Software Tool for import part/net list from C - LINK

Technical Info

Version : 2
Code : 81190403.097

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Contents

Introduction

CAD files are the base for the automatic generation of test program for InCircuit of any technology.

In order to generate the ICT test program in a short time and without errors, both Bed of Nails and Flying Probe testers require the circuit information available in CAD format.

The Import from C-LINK software tool converts the CAD data files of the board from C-LINK format to SPEA Board data format.

Conventions, symbols and abbreviations

In the document, the ⓘ symbol is used to highlight information or notes useful to the reader.

This manual can be updated in accordance with the evolution of the system and associated software.
It may contain preliminary contents or it may not be entirely updated with the latest versions used in the system.

Any remarks on errors and imperfections, or suggestions, can be addressed to:

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1. C-LINK file data

With the “C-LINK CAD files” words we refer to the output information generated by the C-LINK CAD-CAE programs for the electrical diagrams design and PCB development, used to develop a test application (test program and adapter design).

Information stored in the “C-LINK CAD files” concern an electronic board and can be used by an appropriate program to generate a test program and its test adapter design (Bed of Nails or list of movement for Flying Probes).

Information can be grouped in 4 different categories and typically are related to the printed circuit:

Part List
It is the list of all used devices, it must contain: devices drawing reference, part numbers, value, tolerances, device type, etc.
Net List
It is also called wiring list, containing device interconnection data; basically it is presentation of the electric diagram.
Coordinate and access list
It is the list containing the devices coordinates, concerning their barycentre and pins.
Wiring and Routing list
It is the list containing the path of the Net tracks in the PCB.

For the import of the information above mentioned SPEA has developed the specific program for the translation, stored in a specified format, to its common data bank called “Board Data”.
The name of this type of program is “CAD import driver”.

For the required information, see the list in the following paragraphs.

1.1 Part List

The Part List is an ASCII text file, containing the list of all the parts used to assemble the board; sometimes it can be called **Bill of Material** (BOM).

In the Part List all information concerning the mounted and not mounted parts must be present.
For every part the following information must be defined:

Information	Description
Drawing Reference	Reference designator (e.g. U10, R105, D23, etc.).
Part Number	Device code (e.g. 132549.012, C4QW08, 001-58-AA, etc.).
Value	Device value (e.g. 10KΩ, 10µF, 1mH, etc.).
Tolerance	Positive and negative device tolerances (e.g. 1%, 5%, etc.).
Mounting side	The legal values for this item can be: - **Top** (Component side) - **Bottom** (Soldering side) - **Not mounted Top** - **Not mounted Bottom**
Rotation [1]	Device mounting rotation angle (e.g. 0°, 180°, etc.).
Dimensions [1]	Device dimensions.
Case code [1]	Device package (case) code.

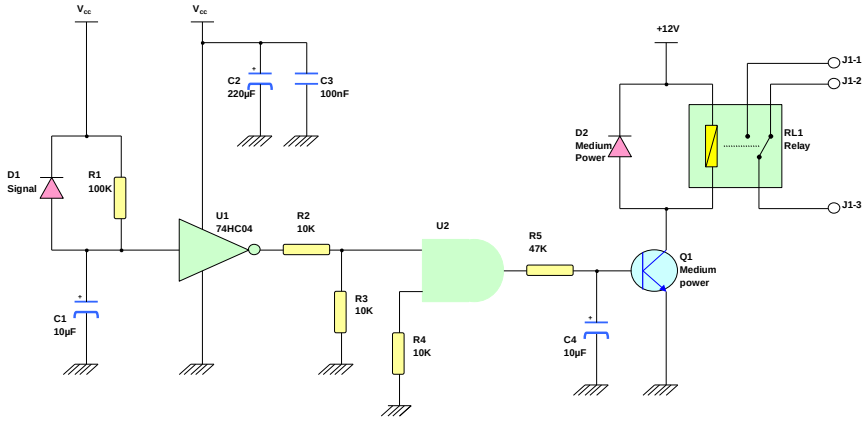
[1] **Optional data (not yet managed)**

1.2 Net List

The Net List is an ASCII text file containing the device interconnection data; it is also called wiring list.
This list must contain the interconnection between devices, including pad and via.
Basically, it is the representation of the electrical diagrams.

For every net the following information must be defined:

Information	Description
Net name	Net identifier (e.g. +5V, RESET, A01, etc.).
Drawing reference	Reference designator of the device connected to the net (e.g. U10, R105, D23, etc.).
Pin name	Name of the device pin connected to the net (e.g. 1, 15, Anode, K, Negative, etc.).
Pin access side	Access side for the device pin, legal values are: - **Top** (Device side access). - **Bottom** (Soldering side access). - **Not accessible** - **All** (both top and bottom side access)



1.3 Coordinates and access list

The Coordinates and access list is an ASCII text file containing the devices coordinates concerning their barycentre and pins. Below, the required information:

Information	Description
Drawing Reference	Reference designator of the device connected to the net (e.g. U10, R105, D23, etc.).
Pin name	Name of the device pin connected to the net (e.g. 1, 15, Anode, K, Negative, etc.).
Pin X position	Pin X-coordinate.
Pin Y position	Pin Y-coordinate.
X barycentre [1]	Device X barycentre.
Y barycentre [1]	Device Y barycentre.

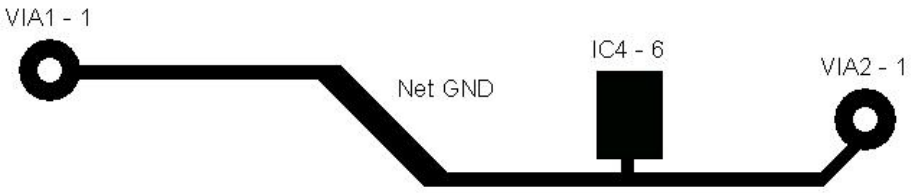
1.4 Wiring and Routing list

The Wiring and Routing list is an ASCII text file that contains all the coordinates of the Net tracks on the PCB and the link with the Net List. So the path of each net on the PCB is described in this file.

For every net the following information must be defined:

Information	Description
Net name	Net identifier (e.g. +5V, RESET, A01, etc.).
X Start	Track segment start X-coordinate.
Y Start	Track segment start Y-coordinate.
X End	Track segment end X-coordinate.
Y End	Track segment end Y-coordinate.
Width	Net segment thickness.
Layer	Layer the segment belongs to.

Example:



[1] **Optional data**

2. C – LINK file generalities

The required C-LINK file is: **<FileName>.DIF**.

It must contain the Part list and the Net list.

The SPEA system is based on a PC platform operating in MS-Windows environment.

The files need to be stored into a user-defined directory.

The SPEA Import from C-LINK software tool can retrieve the C-LINK file from each defined disk and directory.

3. C-LINK file format

The C-LINK files listed below are a significant example of the format that the file must have to be converted into SPEA format.

```
{ PIC_LIB
  { PIC 0                                                    Picture identifier
    { R (0,0) }
    { PINS 1 (0,0) 33 }
    { SPECIFIC "461" }
    { PIC_CENTER (0,0) }
  }
  { PIC 1
    { L (-325,100) (125,100) (125,-100) (-325,-100) (-325,100) }
    { L (25,100) (-225,100) }
    { L (-225,-100) (-242,-99) (-258,-94) (-274,-87) (-288,-78) (-300,-66) (-310,-52)
        (-318,-37) (-323,-21) (-325,-4) (-324,13) (-321,29) (-314,45) (-305,59) (-294,72)
        (-281,83) (-266,91) (-250,97) (-225,100) }
    { L (-225,-100) (25,-100) }
    { L (25,100) (42,99) (58,94) (74,87) (88,78) (100,66) (110,52) (118,37) (123,21)
        (125,4) (124,-13) (121,-29) (114,-45) (105,-59) (94,-72) (81,-83) (66,-91)
        (50,-97) (25,-100) }
    { PINS 2 (0,0) 1 (-200,0) 1 }                            Pin offset from the center
    { SPECIFIC "16510" }
    { PIC_CENTER (-100,0) }
  }
  { PIC 2
    { L (-900,50) (50,50) (100,0) (100,-50) (-900,-50) (-900,50) }
    { L (100,-50) (100,50) (-900,50) (-900,-50) (100,-50) }
    { L (75,-50) (75,50) }
    { L (70,-50) (50,-50) (50,50) (70,50) }
    { PINS 9 (0,0) 26 (-100,0) 26 (-200,0) 26 (-300,0) 26 (-400,0) 26 (-500,0) 26
           (-600,0) 26 (-700,0) 26 (-800,0) 26 }
    { SPECIFIC "6509" }
    { PIC_CENTER (-400,0) }
  }


{ PART_NUMBERS_LIBRARY

      { ELECTRICAL_MODELS
        { MODEL STECKER_LEISTE                               Model identifier
          { TYPE CONNECTOR }
          { PIN_MODEL ANDERE }
          { LIBRARY_ID  }
          { DESC STECKER_LEISTE }
        }
        { MODEL SCHALTER
          { TYPE BLACK_BOX }
          { LIBRARY_ID  }
          { DESC SCHALTER }
        }
        { MODEL IC-SOCKEL
          { TYPE CONNECTOR }
          { PIN_MODEL ANDERE }
          { LIBRARY_ID  }
          { DESC IC-SOCKEL }
        }
        { MODEL MARKER
          { TYPE NON_ELECTRICAL }
          { DESC MARKER }
        }
        { MODEL PAD
          { TYPE BLACK_BOX }
          { PIN_MODEL ANDERE }
          { LIBRARY_ID  }
          { DESC PRUEFBAUTEIL }
        }
        { MODEL DIODE                                        Model type
```

```
    { TYPE DIODE }
    { PIN_MODEL CATHODE1DIODE }
    { FORWARD_VOLTAGE       1.00 }
    { MAX_REVERSE_BIAS       1.00 }
    { MAX_GATE_CURRENT (null) }
    { HTOL       0.00 }
    { LTOL       0.00 }
    { DESC DIODE }
  }
  { MODEL RP_SB_22_KOHM_2%
    { TYPE CPL }
    { PIN_MODEL ANDERE }
    { CPL_MODEL  }
    { DESC SINGLE IN-LINE BUSSED }
  }
  { MODEL RP_DI_10_KOHM_2%
    { TYPE CPL }
    { PIN_MODEL ANDERE }
    { CPL_MODEL  }
    { DESC DUAL ISOLATED }
  }
  { MODEL RES_100_OHM_1%
    { TYPE RESISTOR }
    { RESISTANCE     100.00 }
    { UNITS Ohm }
    { HTOL       1.00 }
    { LTOL       1.00 }
    { MAX_POWER       0.00 }
    { DESC RES 100 OHM 1% }
  }
  { MODEL RES_243_OHM_1%
    { TYPE RESISTOR }
    { RESISTANCE     243.00 }
    { UNITS Ohm }
    { HTOL       1.00 }
    { LTOL       1.00 }
    { MAX_POWER       0.00 }
    { DESC RES 243 OHM 1% }
  }


  { MODEL CAP_10_NF_20%
    { TYPE CAPACITOR }
    { VALUE      10.00 }
    { UNITS n F }
    { HTOL      20.00 }
    { LTOL      20.00 }
    { DESC CAP 10 nF 20% }
  }
  { MODEL CAP_100_NF_20%
    { TYPE CAPACITOR }
    { VALUE     100.00 }
    { UNITS n F }
    { HTOL      20.00 }
    { LTOL      20.00 }
    { DESC CAP 100 nF 20% }
  }


  { MODEL PCAP_470_UF_20%
    { TYPE POLARIZED_CAPACITOR }
    { PIN_MODEL PLUS1 }
    { VALUE     470.00 }
    { UNITS u F }
    { HTOL      20.00 }
    { LTOL      20.00 }
    { DIELECTRIC  }
    { MAX_VOLTAGE       0.00 }
    { DESC PCAP 470 uF 20% }
  }
  { MODEL PCAP_2200_UF_20%
    { TYPE POLARIZED_CAPACITOR }
    { PIN_MODEL PLUS1 }
```

Value and tolerance

```
          { VALUE    2200.00 }
          { UNITS u F }
          { HTOL      20.00 }
          { LTOL      20.00 }
          { DIELECTRIC  }
          { MAX_VOLTAGE       0.00 }
          { DESC PCAP 2200 uF 20% }
        }




        { MODEL 2907
          { TYPE IC_ANALOG }
          { DESC IC-F/V-WANDLER }
        }
        { MODEL 723
          { TYPE IC_DIGITAL }
          { PIN_MODEL ANDERE }
          { PIN_FAMILY  }
          { DESC IC-SP.-LIMITER }
        }


      { PACKAGES
        { PACKAGE CONNECTOR                          Package identifier
          { TYPE CONNECTOR }
          { TESTPROBE CROWN }
          { LENGTH    2000.00 }
          { WIDTH    2000.00 }                       Package dimensions
          { HEIGHT       0.00 }
          { UNITS 1/1000mm }
          { WEIGHT       0.00 }
          { X_CORR       0.00 }
          { Y_CORR       0.00 }
          { WIRE_DIAM       0.00 }
          { CENTER_CALCULATION PINS }
        }
        { PACKAGE XDIP/28
          { TYPE DIP }
          { TESTPROBE CROWN }
          { LENGTH       0.00 }
          { WIDTH       0.00 }
          { HEIGHT       0.00 }
          { UNITS 1/1000mm }
          { WEIGHT       0.00 }
          { X_CORR       0.00 }
          { Y_CORR       0.00 }
          { WIRE_DIAM       0.00 }
          { CENTER_CALCULATION PINS }
        }
        { PACKAGE XDIP/40
          { TYPE DIP }
          { TESTPROBE CROWN }
          { LENGTH       0.00 }
          { WIDTH       0.00 }
          { HEIGHT       0.00 }
          { UNITS 1/1000mm }
          { WEIGHT       0.00 }
          { X_CORR       0.00 }
          { Y_CORR       0.00 }
          { WIRE_DIAM       0.00 }
          { CENTER_CALCULATION PINS }
        }
        { PACKAGE MARKER
          { TYPE SMD }
          { TESTPROBE NO_PROBE }
          { LENGTH    2000.00 }
          { WIDTH    2000.00 }
          { HEIGHT       0.00 }
          { UNITS 1/1000mm }
          { WEIGHT       0.00 }
```

```
    { X_CORR       0.00 }
    { Y_CORR       0.00 }
    { WIRE_DIAM       0.00 }
    { CENTER_CALCULATION PINS }
  }
  { PACKAGE PRUEFBAUTEIL
    { TYPE NO PACKAGE }
    { TESTPROBE SPEAR }
    { LENGTH    2000.00 }
    { WIDTH    2000.00 }
    { HEIGHT       0.00 }
    { UNITS 1/1000mm }
    { WEIGHT       0.00 }
    { X_CORR       0.00 }
    { Y_CORR       0.00 }
    { WIRE_DIAM       0.00 }
    { CENTER_CALCULATION PINS }
  }


  { PACKAGE SIL/9
    { TYPE SIP }
    { TESTPROBE CROWN }
    { LENGTH   22900.00 }
    { WIDTH    2540.00 }
    { HEIGHT    6350.00 }
    { UNITS 1/1000mm }
    { WEIGHT       0.00 }
    { X_CORR       0.00 }
    { Y_CORR       0.00 }
    { WIRE_DIAM       0.00 }
    { CENTER_CALCULATION PINS }
  }
  { PACKAGE SO-A/14
    { TYPE SO }
    { TESTPROBE NO_PROBE }
    { LENGTH    8700.00 }
    { WIDTH    3900.00 }
    { HEIGHT    1600.00 }
    { UNITS 1/1000mm }
    { WEIGHT       0.00 }
    { X_CORR       0.00 }
    { Y_CORR       0.00 }
    { WIRE_DIAM       0.00 }
    { CENTER_CALCULATION PINS }
  }


{ PART_NUMBERS
  { PART_NUMBER C104-Z7-C388
    { MODEL STECKER_LEISTE }
    { PACKAGE CONNECTOR }
  }
  { PART NUMBER C315-Z26-C3
    { MODEL SCHALTER }
    { PACKAGE CONNECTOR }
  }
  { PART_NUMBER C315-Z26-C92
    { MODEL SCHALTER }
    { PACKAGE CONNECTOR }
  }
  { PART_NUMBER C334-Z18-C133
    { MODEL STECKER_LEISTE }
    { PACKAGE CONNECTOR }
  }
  { PART_NUMBER C334-Z18-C134
    { MODEL STECKER_LEISTE }
    { PACKAGE CONNECTOR }
  }
  { PART_NUMBER C334-Z37-C120
    { MODEL STECKER_LEISTE }
    { PACKAGE CONNECTOR }
  }
```

Part number identifier

Model and Package for the specified Part number

```
        { PART_NUMBER C334-Z53-C569
          { MODEL STECKER_LEISTE }
          { PACKAGE CONNECTOR }
        }
        { PART_NUMBER C334-Z53-C571
          { MODEL STECKER_LEISTE }
          { PACKAGE CONNECTOR }
        }
        { PART_NUMBER C334-Z53-C574
          { MODEL STECKER_LEISTE }
          { PACKAGE CONNECTOR }
        }
        { PART_NUMBER C39334-Z71-C121
          { MODEL IC-SOCKEL }
          { PACKAGE XDIP/28 }
        }
        { PART_NUMBER C39334-Z71-C122
          { MODEL IC-SOCKEL }
          { PACKAGE XDIP/40 }
        }
        { PART_NUMBER MARKER
          { MODEL MARKER }
          { PACKAGE MARKER }
        }
        { PART_NUMBER PRUEFPAD
          { MODEL PAD }
          { PACKAGE PRUEFBAUTEIL }
        }
}
        }
        { PART_NUMBER V1609-Z2310-F3
          { MODEL RES_10_KOHM_1% }
          { PACKAGE RMINIMELF }
        }


    { COMPONENTS
      { COMP
        { COMP_DEF
              { NAME N10 }                          Component identifier
              { PART_NR YX }
           }
          { PIN_DEF
          { PIN 1 { NET Net#78 } }
        }
        { PICTURE
          { ORIGIN (3372,-2695) }
          { PIC 0 }
          { ROTATION 0 }
          { M_SIDE 1 }
        }
      }
      { COMP
        { COMP_DEF
              { NAME N11 }
              { PART_NR YX }
           }
          { PIN_DEF
          { PIN 1 { NET Net#78 } }
        }
        { PICTURE
          { ORIGIN (3372,-5372) }
          { PIC 0 }                                 Component location and component picture identifier
          { ROTATION 0 }
          { M_SIDE 1 }
        }
      }

      { COMP
        { COMP_DEF
              { NAME P200 }
              { PART_NR C104-Z7-C388 }
           }
```

```
        { PIN_DEF
        { PIN  1 { NET Net#68 } }
        { PIN  2 { NET Net#69 } }
      }
      { PICTURE
        { ORIGIN (8100,-3410) }
        { PIC 10 }
        { ROTATION 180 }
        { M_SIDE 1 }
      }
    }
    }
    { COMP
      { COMP_DEF
            { NAME U101 }
            { PART_NR V3724-Z340-X5 }
       }
      { PIN_DEF
      { PIN  1 { NET Net#476 } }
      { PIN  2 { NET Net#478 } }
      { PIN  3 { NET Net#58 } }
      { PIN  4 { NET Net#78 } }
      { PIN  5 { NET Net#60 } }
      { PIN  6 { NET Net#52 } }
      { PIN  7 { NET Net#78 } }
      { PIN  8 { NET   } }
      { PIN  9 { NET   } }
      { PIN  10 { NET Net#480 } }
      { PIN  11 { NET Net#477 } }
      }
      { PICTURE
        { ORIGIN (4101,-2600) }
        { PIC 12 }
        { ROTATION 270 }
        { M_SIDE 1 }
      }
    }

    { COMP
      { COMP_DEF
            { NAME R504 }
            { PART_NR V1609-Z2210-F3 }
       }
      { PIN_DEF
      { PIN 1 { NET Net#311 } }
      { PIN 2 { NET Net#11 } }
      }
      { PICTURE
        { ORIGIN (7151,-4793) }
        { PIC 20 }
        { ROTATION 270 }
        { M_SIDE 1 }
        { KIND SMD }
      }
    }
    { COMP
      { COMP_DEF
            { NAME R505 }
            { PART_NR V1609-Z2210-F3 }
       }
      { PIN_DEF
      { PIN 1 { NET Net#11 } }
      { PIN 2 { NET Net#336 } }
      }
      { PICTURE
        { ORIGIN (6974,-4792) }
        { PIC 20 }
        { ROTATION 90 }
        { M_SIDE 1 }
        { KIND SMD }
      }
    }
    { COMP
```

Pin connections

```
        { COMP_DEF
              { NAME C100 }
              { PART_NR V2061-Z3210-K2 }
           }
          { PIN_DEF
          { PIN 1 { NET Net#470 } }
          { PIN 2 { NET Net#78 } }
        }
        { PICTURE
          { ORIGIN (4720,-5146) }
          { PIC 21 }
          { ROTATION 0 }
          { M_SIDE 2 }
          { KIND SMD }
        }
      }

    { NET_DEF
      { NET N.C.
      }
      { NET Net#1                                    Net identifier
        { W (4021,-3540) 5 12 (4021,-3690) 5 12 (4069,-3690) 5 12 (4105,-3726) 5 12
            (4193,-3726) 5 12 (4223,-3756) 5 12 (4660,-3756) 1 12 (4971,-3756) 1 12
            (4971,-3640) 1 12 }
        { W (4971,-3640) 1 12 (4971,-3762) 1 12 (5107,-3898) 1 12 (5488,-3898) 1 12
            (5524,-3934) 1 12 (5524,-4048) 1 12 (5552,-4076) 1 12 (5552,-4237) 1 12
            (5562,-4247) 5 12 (5956,-4247) 5 12 (6041,-4332) 5 12 (6146,-4332) 1 12
            (6099,-4332) 1 12 (6099,-4364) 1 12 }
        { W (4021,-3540) 5 12 (4021,-3690) 5 12 (3952,-3690) 5 12 (3893,-3749) 5 12
            (3893,-4069) 5 12 (3922,-4098) 5 12 (4003,-4098) 5 12 }
        { W (3851,-3340) 1 12 (3970,-3340) 5 12 (3970,-3360) 5 12 (4021,-3411) 5 12
            (4021,-3540) 5 12 }
        { V (4660,-3756) 128 5, 1 }
        { V (5562,-4247) 128 5, 1 }
        { V (6146,-4332) 128 5, 1 }
        { V (3970,-3340) 128 5, 1 }
      }
      { NET Net#11
        { W (6509,-3387) 1 12 (6509,-3517) 1 12 }
        { W (6509,-3517) 1 12 (6502,-3517) 1 12 (6502,-3874) 1 12 (6525,-3897) 1 12
            (6593,-3897) 1 12 (6624,-3928) 1 12 (6624,-4604) 1 12 (6640,-4620) 1 12
            (6877,-4620) 1 12 (6974,-4717) 1 12 }
        { W (6974,-4717) 1 12 (7151,-4717) 1 12 (7151,-4718) 1 12 }
        { W (3751,-3340) 1 12 (3751,-3176) 5 12 (4193,-3176) 5 12 (4221,-3204) 5 12
            (4367,-3204) 5 12 (4394,-3231) 5 12 (5260,-3231) 1 12 (5457,-3231) 1 12
            (5554,-3328) 5 12 (6362,-3328) 1 12 (6421,-3387) 1 12 (6509,-3387) 1 12 }
        { V (3751,-3176) 128 5, 1 }                  Via identifier and coordinates
        { V (5260,-3231) 128 5, 1 }
        { V (5554,-3328) 128 5, 1 }
        { V (6362,-3328) 128 5, 1 }
      }
      { NET Net#15
        { W (4051,-3340) 5 12 (4053,-3338) 5 12 (4137,-3422) 5 12 (4137,-3455) 1 12
            (4447,-3455) 5 12 (4447,-3466) 5 12 (4521,-3540) 5 12 }
        { W (4521,-3540) 5 12 (4571,-3590) 5 12 (4621,-3590) 5 12 (4671,-3640) 5 12 }
        { W (3651,-3040) 5 12 (3717,-3106) 5 12 (4051,-3106) 1 12 (4051,-3340) 1 12 }
        { V (4137,-3455) 128 5, 1 }
        { V (4447,-3455) 128 5, 1 }
        { V (4051,-3106) 128 5, 1 }
      }
      { NET Net#18
        { W (3393,-3111) 1 12 (3393,-3089) 1 12 (3265,-3089) 1 12 (3265,-3104) 1 12 }
        { W (3265,-3104) 1 12 (3265,-3193) 1 12 }
        { W (3265,-3104) 1 12 (3076,-3104) 1 12 (2985,-3013) 1 12 (2985,-2801) 1 12
            (3049,-2737) 1 12 }
        { W (3971,-3640) 5 12 (3971,-3504) 5 12 (3957,-3490) 5 12 (3938,-3490) 5 12
            (3921,-3472) 5 12 (3921,-3248) 5 12 (3651,-3248) 1 12 (3515,-3111) 1 12
            (3393,-3111) 1 12 }
        { W (4546,-3410) 5 12 (4626,-3490) 5 12 (4652,-3490) 5 12 (4671,-3509) 5 12
            (4671,-3569) 5 12 (4692,-3590) 5 12 (4701,-3590) 5 12 (4721,-3610) 5 12
            (4721,-3772) 5 12 (4734,-3772) 5 12 (4734,-3759) 5 12 }
        { W (4546,-3410) 5 12 (4481,-3345) 5 12 (4457,-3345) 5 12 (4360,-3248) 5 12
            (3921,-3248) 5 12 (3921,-3472) 5 12 (3938,-3490) 5 12 (3957,-3490) 5 12
```

```
            (3971,-3504) 5 12 (3971,-3640) 5 12 }
        { V (3651,-3248) 128 5, 1 }
```

4. Import setting

4.1 Pin function assignment

In order to correctly execute the CAD file import, this assignment table must be filled.

In order to correctly test some polarized devices such as diodes, bipolar transistors, etc., it is basic to correctly identify the pin function (i.e. anode, base, etc.) of each pin.

The fields contained in the table are described below:

Field	Description
Device Type	Identifies the type of device (example: Resistors, Capacitors, Digital Devices, Diodes etc.).
Pin Function	Function concerning the Pin.
Pin Name	Pin reference.
Cad Pin	Pin reference in Cad file.

4.2 Drawing ref. initials/device type assignment

The C-LINK file typically contains all information about the devices, such as value, tolerances and type; which are fundamental from the point of view of the test program generation.

The fields contained in the table are described below:

Field	Description
Drawing Reference	Initial letter identifying the **Device Type**.
Device Type	Identifies the type of device (example: Resistors, Capacitors, Digital Devices, Diodes etc.).
Default Tol+, Tol-	Value and tolerance of the device only if required (as for resistors).

It could happen that in the CAD file they are missing. For each drawing reference initial, the displayed table enables to define the following data default values:

- Device type
- Default positive tolerance
- Default negative tolerance

This means that if, for any reason, the CAD file does not contain the information mentioned above, the default values will be used.

5. Component Properties Identification

The ATPG Software of SPEA Systems requires to identify the following data for each component:

Passive Components:

- **Component Family**
- **Part Number**
- **Component Value**
- **Tolerance + and -**

Other Components:

- **Component Family**
- **Part Number**
- **Device Name** (commercial name)

The **Component Family** is not specified in the Part List file, so it is necessary to fill a table containing the assignment between Drawing Reference initials and Component Family and the CAD Type before executing the import process.

The table contains also the default tolerance for the specified family of components.

Example:

Device Type	Prefix	Default Tol+	Default Tol-	CAD Type
Capacitor	C	20	20	Capacitor
Resistor	R	10	10	Resistor
Connector	J			Connector
Digital IC	IC			Digital IC

For polarized components such as diodes, it is important to identify the pin function (e.g. Anode) of each pin.
Before running the import, it is necessary to edit the pin Id/pin function table.

Example:

Device Type	Pin Function	CAD Pin Id
Diode	Anode	ANODE
Diode	Cathode	CATHODE
Capacitor Polarized	Positive	PLUS
Capacitor Polarized	Negative	MINUS

6. Component properties default value

The SPEA Import software automatically assigns a default value if all component properties or part of them are not available in the CAD file.

In this case a further manual ending can be done to perform the required modifications by using the Board Data editor.

The default values are shown in the following table:

Property	**Default Value**
Component Family	Not identified
Value of component	0
Tolerance	0
Device Name	None