## NAME

hyp2mat − convert hyperlynx files to octave/matlab scripts for electromagnetic simulation.

## SYNOPSIS

**hyp2mat** [*-h*] [ *-o outfile* ] [ *-f pdf|csxcad* ] [*-n net*]... [*OPTIONS*]... [*-v*] [*infile*]

## DESCRIPTION

hyp2mat 0.0.15

Converts Hyperlynx Signal−Integrity Transfer Format files to Octave/matlab scripts.

## OPTIONS

**−h**, **−−help**
Print help and exit

**−V**, **−−version**
Print version and exit

**−o**, **−−output**=*filename*
Output file. (default=‘−’)

**−f**, **−−output−format**=*ENUM*
Output file format. (possible values="csxcad", "pdf" default=‘pdf’)

### Processing options:

**−n**, **−−net**=*STRING*
Import net. Repeat to import several nets. Default is importing all nets.

**−l**, **−−layer**=*STRING*
Import layer. Repeat to import several layers. Default is importing all layers.

**−x**, **−−xmin**=*DOUBLE*
Crop pcb. Set lower bound of x coordinate.

**−X**, **−−xmax**=*DOUBLE*
Crop pcb. Set upper bound of x coordinate.

**−y**, **−−ymin**=*DOUBLE*
Crop pcb. Set lower bound of y coordinate.

**−Y**, **−−ymax**=*DOUBLE*
Crop pcb. Set upper bound of y coordinate.

**−z**, **−−zmin**=*DOUBLE*
Crop pcb. Set lower bound of z coordinate.

**−Z**, **−−zmax**=*DOUBLE*
Crop pcb. Set upper bound of z coordinate.

**−−grid**=*DOUBLE*
Set output grid size. (default=‘10e−6’)

**−−arc−precision**=*DOUBLE*
Set maximum difference between perfect arc and polygonal approximation. (default=‘0’)

**−−clearance**=*DOUBLE*
Set default trace−to−plane clearance. (default=‘0.0002’)

**−−flood**=*STRING*
Flood layer with copper. Repeat to flood several layers. The value "plane_layers" floods all plane layers.

### Physical properties:

**−−epsilonr**=*DOUBLE*
Set epsilon r of dielectric.

**−−loss−tangent**=*DOUBLE*
Set loss tangent of dielectric.

**−−bulk−resistivity**=*DOUBLE* Set bulk resistivity of copper (in Ohm meter).

**CSXCAD output options:**

**−−pcb−outline**
Detailed board outline. (default=off)

**−−lossy−copper**
Model copper as lossy. Default is modeling copper as perfect conductor. (default=off)

**−−metal−3d**
Model copper layers as 3D. Default is modeling metal as 2D sheet. (default=off)

**PDF output options:**

**−−hue**=*DOUBLE*
Set PDF color hue. Range 0.0 to 1.0 (default='0.0')

**−−saturation**=*DOUBLE*
Set PDF color saturation. Range 0.0 to 1.0 (default='0.6')

**−−brightness**=*DOUBLE*
Set PDF color brightness. Range 0.0 to 1.0 (default='0.9')

**Debugging options:**

**−r**, **−−raw**
Raw output. Do not join adjacent or overlapping copper. (default=off)

**−d**, **−−debug**
Increase debugging level. Repeat for more detailed debugging.

**−v**, **−−verbose**
Print board summary.

Hyperlynx input files conventionally end in **.hyp** .

*hyp2mat* reads input from file *infile***.** If no input file is specified input is read from standard in.

If no output file is specified output is to standard out.

If a syntax error occurs during conversion, error recovery is attempted. *hyp2mat* exits with zero status if conversion was succesful and non-zero if not.

The **--verbose** option can be used to list board dimensions.

If only a small region of the board needs to be simulated the **--xmin --xmax --ymin --ymax --zmin** and **--zmax** options can be used to crop the board to a smaller region.

If not all layers of the board need to be simulated, the **--layers** option may be used to specify layers of interest.

If not all nets of the board need to be simulated, the **--nets** option may be used to specify nets of interest. The option **--net=?** lists all available nets.

Circles and arcs are approximated by polygons. By default a circle is approximated by an octagon. If higher accuracy is needed, set **--arc-precision** to the desired precision. This will increase the number of line segments used to draw circular, oval and oblong pads, amongst others.

To simulate a lossy dielectric, copy AddHyperLynxDielectric.m to your project directory and customize.

The **--flood** option floods layers with copper. The flooded copper respects trace-to-plane clearances. Copper net name is identical to layer name.

Typical use of *hyp2mat* is with simulation packages such as OpenEMS.

All lengths are in meters.

## FILES

**/usr/share/hyp2mat/matlab/**
Supporting matlab routines for OpenEMS.

**/usr/share/hyp2mat/eagle/**
Examples and tutorial.

## EXAMPLES

Convert pcb.hyp to pdf:
hyp2mat -o pcb.pdf pcb.hyp

Examine original Hyperlynx file:
hyp2mat -o pcb.pdf --raw pcb.hyp

Draw arcs with an accuracy of 10 mil or better:
hyp2mat -o pcb.pdf --arc-precision 0.000254 pcb.hyp

## NOTES

Board outlines and copper polygons should not be self-intersecting.

Common causes of syntax errors are unquoted strings, and unassigned component values.

### Unquoted strings

Error: *syntax error, unexpected STRING at 'Logo'*

Source:
(? REF=My Logo BOT1 L=Bottom_Layer)

Cause: An unquoted string contains a space (' ').

Solution:
Edit the .hyp file and put the string between double quotes:
(? REF="My Logo BOT1" L=Bottom_Layer)

### Unassigned component values

Error: *syntax error, unexpected L, expecting FLOAT or STRING at 'L'*

Source:
(R REF="R1" VAL= L="Top")

Cause: Component has not been assigned a value (VAL=).

Solution:
Edit the .hyp file and assign a value to resistor R1:
(R REF="R1" VAL=0 L="Top")
or assign the resistor a value in the schematics editor and re-export to HyperLynx.

## AUTHOR

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## SEE ALSO

*octave*(1)
*OpenEMS*, a free and open-source electromagnetic field solver using the FDTD method.