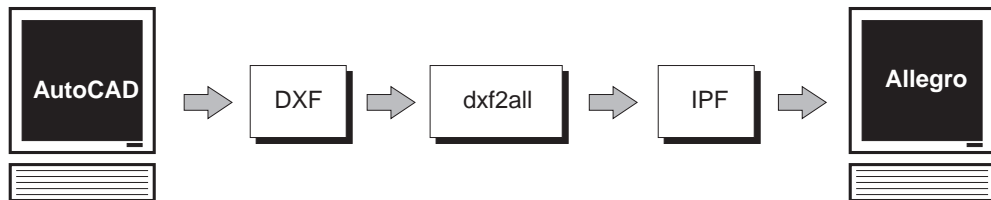


Chapter 4

DXF to Allegro Translator

This translator reads a DXF file generated by AutoCAD or by other mechanical drafting programs and converts it to an Allegro intermediate plot file. The plot file can then be imported into Allegro. This is a simple but effective way to load in board outlines, component placements or other layout related information without manually drawing it.



dxf2all Command Line Syntax

```
dxf2all infile outfile [-units U] [-scale X] [-fontdir S]
[-text explode/ignore] [-nodim] [-nohatch] [-outline] [-arcres X]
[-nonode]
```

where

<infile>	the DXF input file name.
<outfile>	the Allegro plt file name.
-units U	unit of DXF file, inch, mil, cm, mm, um. If not specified defaults to IN.
-scale X	scale output by X. Default=1
-fontdir S	S specifies the shx files directory.
-text explode	explodes strings of text into strokes.
-text ignore	ignores strings of text in the DXF file
-nodim	suppress dimensions (those where AutoCAD has created them using the *d block name).
-nohatch	suppress hatching. (those where AutoCAD has used the *h block for hatch lines)
-outline	polylines with width are translated to an outline.
-arcres X	arc resolution for translating arcs to lines. Default value is 9 degrees but you can specify range from 2 degrees to 15 degrees.
-nonode	nodes are not translated.

DXF to Allegro Mapping

DXF	Allegro IPF Entity
Layer	Layer number in DXF is mapped to Allegro color number. Allegro color numbers range from 1-31, so DXF layer 0 and 1 are both mapped to color 1; DXF layer 32 will be mapped to Allegro color 1 and so on.
color by entity	ignored. dxf2all maps layers to Allegro color numbers.
dimensions	explode into their constituent lines arcs and text.
linetype	Ignored.
line	Allegro Lines.
polyline	Allegro Line segments. The pline width is mapped to the width (if it is constant).
zero width closed polylines	Allegro Line segments with zero width.
blocks	All blocks in DXF are flattened/exploded.
text	The program generates a set of maximum 16 text styles based on text width, height, shx file, obliquing and frequency of usage. All strings of text that fall into this set are generated as Allegro Text; while others are exploded into Allegro Lines. Currently any text contained inside of a block is also exploded into Allegro Lines because the blocks might be scaled and/or rotated and that would generate complications when sorting out a set of 16 optimum text styles.
solids	Allegro Polygons (not filled).
circles	Allegro Figures - Circle.
pline with width	Allegro Lines with width.
point	Allegro Figures - Point.

Detailed Notes

Blocks - AutoCAD blocks are named groups of entities that can be reused. No such equivalent exists in ipf so the translator simply explodes the block. Blocks can contain other blocks; this is called nesting. dxf2all keeps exploding the nested blocks until only entities are left. A block can be inserted with scaling, rotation or mirroring.

Units - An AutoCAD DXF file is essentially dimensionless and has no unit information as part of the file. A line 10 units long could represent mils, inches, microns etc... This is why you should always specify the units of the DXF file when running the translation.

Precision - AutoCAD stores all data values using double precision floating point numbers and users can specify the number of places that the DXF file will contain. The default is 6 places so a drawing in inches will have data to 0.000001 inch. However, the ipf format is in mils with data resolution to 0.001 inch so in almost all cases any loss of precision is due to the PLT files fundamental limit.

3D Data - AutoCAD can create 3D data - dxf2all ignores all Z axis data and only translates X,Y coordinates. dxf2all ignores any of the new 3D entities in ACAD R13 that are based on ACIS.

Text Styles, Fonts and Mapping - AutoCAD Text and ipf text are handled completely differently.

AutoCAD allows one to define a “style” and then to insert text using that style but with a different height for each insertion. IPF builds a “style” for each different height. Since IPF only has space for 16 unique styles it is not uncommon that the 16 styles will be used up; insertions of different height cannot be assigned to any one style. In such cases, the dxf2all explodes any text with new heights. This sometimes results in text from DXF importing to Allegro as strokes instead of strings of text.

Loading .plt Files into Allegro

To load an intermediate .plt file into Allegro follow these steps:

Click on **Process**

-> Click on **Mfg**

-> Click on **Artwork**

This sequence will open the artwork menu:

Click on **Load**

-> Click on **Penplot**

specify the penplot name [.plt]

The plot image will appear at the cursor. The Allegro operator needs to pick a location on the screen to place the plot on. Before placing the plot on the screen you can click middle mouse button to show options:

Rotate

Mirror

Scale

Cancel

Plot File Class and Subclass Restrictions

Allegro loads the intermediate plot file data into the "Class" MANUFACTURING. Each entity will be loaded into a "Subclass" named PEN**, where ** represent the pen number on the carousel according to the palette control file in Allegro. For example PEN2. If no Subclass by that name exists it will be created.

A built in Allegro constraint is that elements in Allegro can be moved from one subclass to another, but they can't change class. For example, many DXF files convey information about the board outline. Allegro has a standard subclass "BOARD OUTLINE" but it belongs to class "BOARD GEOMETRY", and as mentioned, elements in class "MANUFACTURING" can not be moved to class "BOARD GEOMETRY".

Log File

DXF2ALL writes a log file to disk summarizing the results of the translation. A sample log file is shown below

```
DXF to Allegro 1.10 10/28/96 SUN4 Key 807ac80d asmscl2
(C) 1989-96 Artwork Conversion Software, Inc. (408) 426-6163
```

```
Begin Job: Mon Jul 28 14:13:26 1997
```

```
Command line:
```

```
../d2alleng mwave.dxf -ipf mwave.plt -allegro -fontdir ../ -atfntmap
-units mil -scale 1000 1 -dim -hatch -tl -arcres 9 -z
```

```
Layer Name      : 0
Layer Linetype  : CONTINUOUS
Layer Color     : 7
Layer Flags     : 64
```

```
Layer Name      : TOPMET
Layer Linetype  : CONTINUOUS
Layer Color     : 2
Layer Flags     : 64
```

```
Layer Name      : RES1
Layer Linetype  : CONTINUOUS
Layer Color     : 6
Layer Flags     : 64
```

The command line is useful for repeating your work; if you have a problem with a file sending in the log file with your problem file will enable us to easily duplicate your settings.

```
Begin Block: CIRCUIT
```

```
End Block: CIRCUIT
```

```
Begin Block: CUTMARK
```

```
End Block: CUTMARK
```

```
Begin Entities:
```

```
End Top Block: ENTITIES
```

```
End Job: Mon Jul 28 14:13:27 1997
```

```
Extents for layer mwave.plt:
```

```
-----
Xmin:                0.000000 Xmax:                2000.000000
Ymin:                0.000000 Ymax:                2000.000000
```

The extents information is quite useful since the numbers may indicate whether you used incorrect units. In this example the extents of 2000 x 2000 plot units indicate a 2x2 region which is as expected.

```
End Job: Mon Jul 28 14:13:30 1997
```