

**ASM 800
DXF2EGS & EGS2DXF
Bidirectional Translator**

ASM 800

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Chapter 1

Introduction

ASM 800 is a bidirectional translator between AutoCAD's DXF file format and Hewlett Packard's EGS Archive File format. The program was developed for electronic engineers, mechanical designers, architects and civil engineers who need to exchange data between the two CAD systems. ASM 800 is compatible with the archive file created by Durst CAD Consulting's Graffy program.

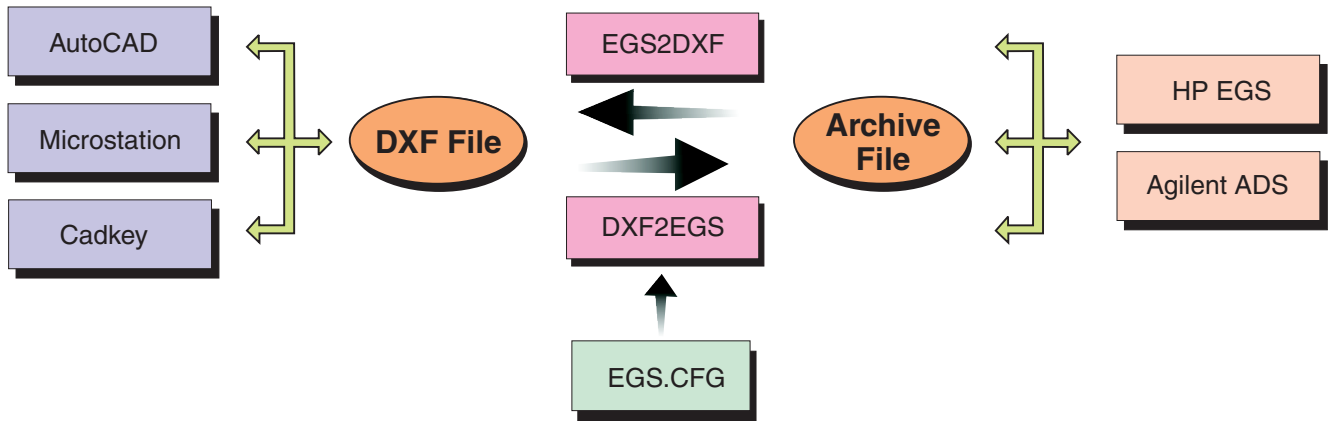


Figure 1-1. Flow Chart of ASM 800. The two modules are independent.

Windows Installation

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Chapter 2

Windows Installation

Installation of Artwork's Windows based programs is the same for all applications. We use *Install Shield* to uncompress files from the CD or Internet download and copy them to the directory of your choice, install required DLL's, create the program group, update the registry and install the example files. You attach the "hardware key" to the parallel port and enter the "key strings" to complete the installation.

Hardware/OS Requirements

- Pentium Class or higher CPU.
- 64 Mbytes RAM recommended.
- 256 color display with at least 800 x 600 resolution. Our dialog boxes will not be fully visible on a 640 x 480 display.
- 5-10 Mbytes of disk space.
- Windows 95/98/NT4/2000.
- Mouse or other pointing device.
- Parallel Port for the Hardware Key or Network Card for MAC address locking.

Supporting DLLs and Drivers

- **Sentinel Driver for NT.** Since our programs cannot access the parallel port directly on NT a special driver provided by Rainbow (our key mfg) must be installed. This is automatically installed¹ if you have selected Hardware Key (Sentinel) Locking and you are running on NT.

¹: Some users have machines set up in a way that they do not have write privileges to certain directories including the Windows system directory. In that case it may not be possible for the Install Shield program to load drivers such as the Sentinel Driver. If this occurs you need to arrange with your system administrator to run the installation again with full privileges.

Installation Procedure

- 1 Insert the CD into your drive
- 2 Double click on the setup.exe (or on the self extracting .exe for downloads)
- 3 Follow the screen instructions and prompts. You can select the drive and directory where the programs will be installed. Example files are usually installed in a subdirectory called examples under the program directory. You can override the default selections. by pressing **Browse...** and choosing a new destination.

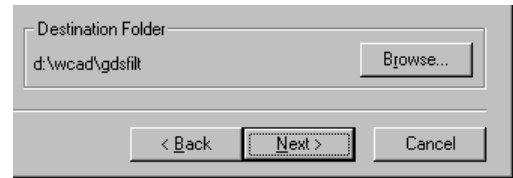


Figure 2-1. When the Destination Folder Menu comes up, the user can choose where the program will be installed.

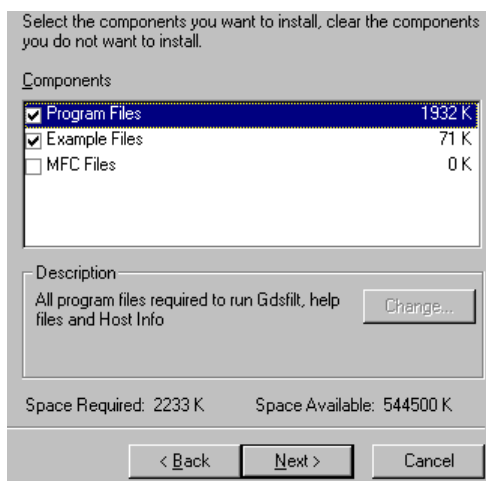


Figure 2-2. This screen shows an example of how the user can select which components to install.

Components

You can also select which components to install. Normally you do not need to install the examples during an upgrade.

Security

There are three different types of security:

Host ID - a unique serial number is derived from your network card's MAC address (note on NT machines with two network cards this can fail)

Sentinel Parallel Port Key - a Sentinel-C dongle is attached to one of the parallel ports. This provides a unique serial number for the application.

Floating Network License - a license server runs a program known as a license manager. The LM gets requests from the application over the network and returns permission to execute.

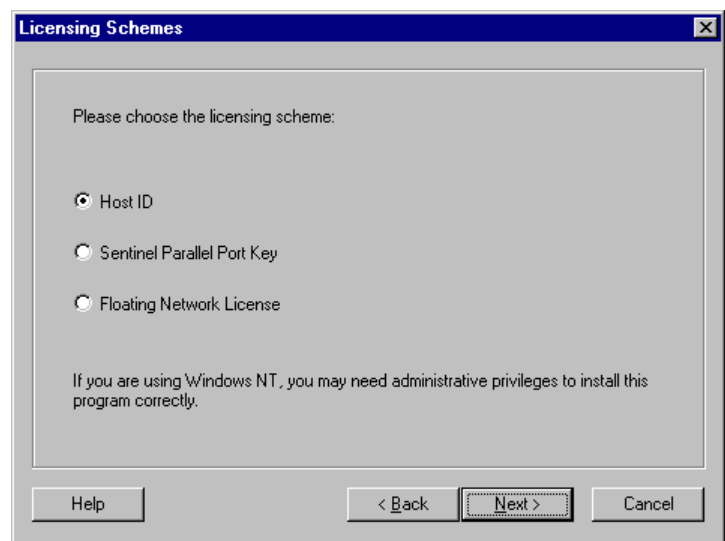


Figure 2-3. The Installation Licensing Schemes Menu.

When you purchase our software you select which type of licensing to use. The keycodes that are generated reflect the type of licensing. During the Install you must enter the type of security to be used.

Key Strings

If this is your first installation please type or paste them into the box provided. If you are updating or otherwise overwriting the execs you should not need to re-enter the key strings a second time as long as you install into the same directory as before.

```
EVdYjWJ OJDGfFR YDNXcJM UNXcUdV OXTUXMi MTNeRWX cDFRPKL
```

Our key strings consist of 7 groups of 7 characters. No numerals are used so it is impossible to confuse the letter “l” (larry) and the number “1” (one) or the number “0” (zero) and the letter “O” (Oscar). Please pay attention to upper and lower case since these do make a difference.

If possible obtain your keystings by email so that you can paste them into the box. Typing is prone to errors.

The key string you entered is stored in a file called **ACS.KEY**. The key file must be located in the same directory as the executables. Inside the file you will find an entry such as:

```
!#ACS EVdYjWJ OJDGfFR YDNXcJM UNXcUdV OXTUXMi MTNeRWX cDFRPKL
```

Modifying the Key Strings

If you need to modify a key string after the program is installed you can do so from the **Help** pulldown within your application as shown here:

Or you can use a text editor such as the notepad to directly edit the ACS.KEY file. Either approach will work.

The Hardware Key

Artwork’s programs can be secured using a hardware key that attaches to the parallel port. The key will work on LPT1, LPT2 or LPT3. If a printer was attached to the port re-attach it behind the key. The printer must be turned on for the key to work.

Damage to Hardware Key

The **Iomega parallel port ZIP drive** is known to damage the Sentinel-C key when attached behind it. If you must use the parallel Iomega Zip drive get a second parallel port and put the hardware key on a separate port.

The keys are fairly rugged; however we have found that moving them from machine to machine on a daily basis will eventually damage the key either through static electricity or by breaking a pin. Accidentally inserting a key into a serial port could also burn out the key since serial ports can have +12 and -12 volts on some pins.

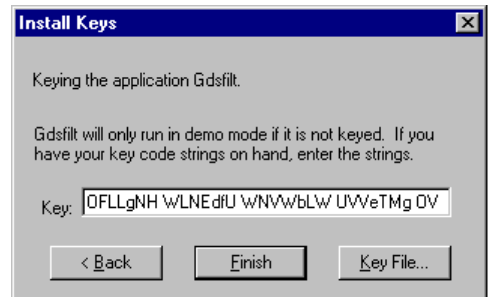


Figure 2-4. The Install Keys menu.

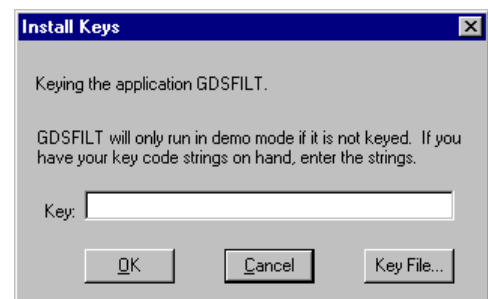


Figure 2-5. The Install Keys menu can also be accessed from the Help pulldown.

Hardware Key Conflicts

Our hardware key may or may not work in conjunction with other keys on the same port. Sometimes the order in which they are attached can make a difference. **If you encounter a conflict the best solution is to put our key on a second parallel port.** Generally speaking the Rainbow Sentinel hardware key does not work on the same parallel port together with other Rainbow Sentinel keys but does work on the same port with Rainbow Pro and SuperPro keys.

You can also avoid the hardware key altogether by using **hostid** locking to your network card's MAC address as described later in this chapter.

Parallel Switch Box?

A parallel switch box can also be used to select between two keys - however this may be of limited value if you need to toggle between two programs since our program does check the key during program operation and not just at start up.

Host ID Locking - Replace the Key with Your Network Card!

Artwork has developed a technique to lock its Windows based software to a network card installed in the computer instead of using a hardware key (dongle). From the network card's MAC address we derive a **hostid** which substitutes for the dongle's serial number.

Getting Your HostID

You can use the program called hostinfo.exe to get the hostid of your machine.. If it is able to read the hostid you will see a screen as follows:

You need to send us the Hostid address of your machine. You can cut and paste this into your email tool or into notepad or other text editor as needed.

In general, it will be able to get a reading if you have a network card installed and TCP/IP services enabled.

Hostid Locking does not always work even if you have a network card installed. It depends on Windows winsock.dll services and there are configurations where networking is configured in a fashion that prevents our program from obtaining a valid MAC address. For more details check our WEB site at

www.artwork.com/support/index.htm.

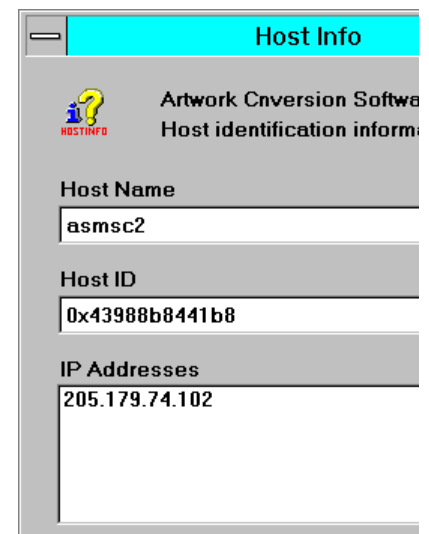


Figure 2-6. The Host Info Menu.

Common Problems and Solutions

Here are the most common installation problems reported by our users and the solution. Please go through this list prior to calling tech support.

Problem: Program runs in demo mode because it cannot find a valid key string.

Reason The key string file is missing. Look for the file called ACS.KEY . If not present you can run the key install from the Help pull down on your program.

Reason The key string file is not located in the same directory as the executables. Using the file manager make sure that the key string file ACS.KEY is located in the same directory as the executable. If you have more than one translator from Artwork insure that you have an ACS.KEY file in each executable directory and that each ACS.KEY file contains the correct key strings for that program.

Reason The keystring is typed in incorrectly. Fix it with a text editor or re-enter from the Help pull down. For example, we have noticed many users do not type in the blank space between each group of characters.

Reason The keystring and the program executed do not match. Find out why. You may have entered a key string for a different program. Remember that different Artwork Windows' programs should be installed in different directories.

Reason The keystring and the hardware key serial number do not match.

Problem: The hardware key is attached but cannot be read.

Reason Another hardware key is on the same parallel port and is interfering. Our hardware keys will work on LPT1:, LPT2: and LPT3:. Try moving one key to another port.

Reason The printer is attached behind the key and turned off thus shunting the key. Turn on the printer.

Reason certain laptops have non standard parallel ports that don't work. No easy solution here.

Reason The hardware key is not attached to the parallel port but to some other port.

Reason The hardware key has been damaged - usually either a pin is bent or cracked or static electricity has killed it. This is most likely if it is often moved from machine to machine.

Reason You are running on Windows NT and Install Shield could not install the Sentinel drivers because your system directory is read/execute only. Solution: Get your sysadmin to run the Install Shield program using his logon which should have full priviledges.

Reason The hardware key is not attached at all.

Chapter 3

Archive to DXF

Creating an EGS Archive File

From within EGS or Graffy use the archive command to create an archive file of your drawing. You do not need to use the :S or LI options. **You must use the :P option** to output the current process file header. One should also smash any macros since the translator cannot translate macros to DXF.

Example

```
ARC :P #3amp;
```

Running EGS2DXF

```
egs2dxf [enter]
```

```
EGS2DXF Converter Version 6.15      Key 8526 - 0014  
Copyright 2002 Artwork Conversion Software, Inc. (831) 426-6163
```

```
Enter EGS File Name:  amp.egs      [enter]  
Enter DXF File Name:  <amp.dxf>:     [enter]  
Start Conversion? Y/N  <Y>:       [enter]
```

```
Processing File:  AMP.EGS  
Analyzing File line #383  
*****  
Program Complete. Writing DXF File to Disk
```

Command Line Syntax

EGS2DXF can be run completely from a command line. There are several switches that affect the translation.

```
egs2dxf  [[-h] Source[.egs] [Target[.dxf]]] [-al] [-c-] [-sh]
```

Where

-h Displays this message.

Source Input EGS file name.

Target Output DXF file name.

-al Enable polyline dimensioning. Normally EGS2DXF will use an instance called l_arrow and r_arrow to draw the arrows for dimensions. Sometimes these instances are not defined or improperly defined. In that case, use the -al option and EGS2DXF will draw arrow heads using a tapered DXF polyline.

-c- Disables translation of construction lines to DXF.

-sh Use polylines with width to support solid hatch. DXF has no solid hatch so normally EGS2DXF uses a zero width polyline and hatch spacing is set by the SHATCHWIDTH parameter in EGS.CFG. in solid. By using the -sh option you instruct EGS2DXF to support solid hatch by using a poly line with width where the width of the polyline is determined by the :W parameter in the ADD HATCH if it is > 0. If : W0 then the GRID value in the EGS process file header is used.

-nonam a) EXIT and SAVE command are treated the same. Either command can be used to end named or unnamed instances.

-t Makes all invisible TEXT entities in EGS visible. The default is not to translate any text entity that is marked invisible.

-empty[=R] This option translates undefined instance references into a box with an X inside of it. The optional parameter R determines the box's dimensions. R defaults to 1.

Notes on Hatching

EGS uses a hatch description. For example the ADD Hatch command lists a series of points that define the hatch boundary. It also specified a hatch type and hatch spacing. This is a very efficient way to describe many hatch patterns. Auto CAD on the other had actually stores each hatch stroke. This can result in files that are just enormous. One should take care if translating EGS files with solid hatching to use the SHATCHWIDTH parameter in the EGS.CFG and set it to a reasonable number.

EGS to DXF Translation Table

EGS Entity	DXF Entity	Comment
Arc	Arc	Arc or Polyarc (if EGS arc has width)
Circle	Circle	Two Polyline arcs if circle has width
Hatch	Supported	AutoCAD doesn't have a "solid" hatch. See command line option -sh for details on how to control this in DXF.
Instance	Block	
Line	Polyline	n/a

EGS Entity	DXF Entity	Comment
Marker	Point	EGS2DXF sets PDMODE to 65 and size to 5 percent of extents. User can redefine this from within AutoCAD.
Oval	Polyline	AutoCAD has no oval entity.
Polygon	Polyline	AutocAD polygon not same as EGS polygon.
Rectangle	Polyline	n/a
Text/Note	Text	Text and Notes are mapped to different styles. See detailed info in the EGS.CFG section on how to control the mapping.
Dimension	Dimension	We have created a block for each dimension rather than use the AutoCAD DIM entity.
Dim_dec	N	n/a
Dim_dir	N	n/a
Dim_extend	Y	n/a
Dim_fsize	N	n/a
Dim_radix	N	n/a
Dim_scale	Y	n/a
Dim_tfsize	N	Text for dimensions has its own style in AutoCAD defined as DIMFONT.STY
Dim_tslant	Y	n/a
Dim_units	N	n/a
Equate	Y	Layer parameters passed are color, number, and line type.
Tslant	Y	Redefines the AutoCAD style to incorporate text slant.
File Size		No limit. Uses dynamic memory allocation.
Implicit Stepping	Y	n/a
Fill	Y	Fill definitions and behavior are different in AutoCAD. AutoCAD has a global fill parameter for limited entities only. EGS fill can be specified entity by entity. Therefore fill information is lost when transferred to DXF.

EGS Entity	DXF Entity	Comment
Associated Text	Y	DXF has no associated text for entities. Text is exploded and placed. Text associated with instances is attached to EXF blocks as a hidden attribute.
Process File Header	Header	Process file header required.

Text Mapping

In EGS there are three types of text strings: TEXT, NOTES and DIMENSIONS. egs2acad creates three text style definitions in DXF.

EGS	AutoCAD Style	AutoCAD Font File
TEXT	TEXTFONT	default "txt" or user set in EGS.CFG
NOTES	NOTEFONT	default "txt" or user set in EGS.CFG
DIMENSIONS	DIMFONT	default "txt" or user set in EGS.CFG

Unfortunately the standard AutoCAD font files such as "txt" do not exactly match the EGS fonts especially in the height/width ratio. This may result in the AutoCAD text not fitting properly inside of boxes or other restricted areas. IT is possible to purchase custom AutoCAD fonts built to match the EGS fonts. Please contact Artwork for more information if this is required by your application.

EGS Entities with Width

EGS allows the designer to modify many entities to have width. AutoCAD may not have a corresponding entity. Here is how the egs2acad translator attempts to map the following entities with width:

ARC

Built up from polylines with width.

CIRCLE

Creates two polyline arcs with width - each 180 degrees.

LINE

Creates a polyline with width

OVAL

Creates a polyline with width. Since AutoCAD has no oval the oval is approximated by a series of short segments.

POLYGON

Creates a closed polyline with width.

RECTANGLE

Creates a closed polyline with width.

The Configuration File EGS.CFG

When EGS2DXF starts up it reads configuration information from a file called EGS.CFG. The EGS.CFG file should be created or modified by the user with an ASCII text editor to control the translation process..

EGS.CFG contains keywords followed by data. Some keywords are required; others are optional. If no EGS.CFG file is available egs2acad will make certain default assumptions. These may or may not be suitable for your drawing

Location of the File

EGS2DXF first searches the current directory for EGS.CFG. It then searches the executable directory for the file. The UNIX version of EGS2DXF looks for the file name using lower case egs.cfg and upper case EGS.CFG.

EGS.CFG Keywords for EGS2DXF

All keywords must be in upper case and should start in column 1. Anything in the EGS.CFG file that is not a keyword is ignored. The parameters that follow the keyword must follow immediately after with no intervening blank lines. You may see additional keywords in the EGS.CFG that do not appear here. They are used by the DXF2EGS program and EGS2DXF will ignore them.

ARCRES

```
arc_resolution_in_degrees
```

Arc resolution used to draw an oval in DXF. Since DXF has no oval entity we build this from a polyline. Default uses the default_arc_res parameter in the EGS process file.

Example

```
ARCRES  
4
```

ARRSCALE

```
arrow_scale
```

Value of scale factor for dimension arrows. We added this parameter because there were some EGS files where the arrows appeared too large in the DXF drawing. This enables the designer to enter a value that looks correct. Default=1.

Example

```
ARRSCALE  
0.25
```

INSLAYER

layer_name

Layer on which to insert AutoCAD blocks. EGS does not associate a layer with an instance call. Default is layer 0.

Example

```
INSLAYER  
100
```

Layer

DXF_layer_name EGS_Layer_number [layer_color]

The layer keyword is very powerful and is used to map EGS layer numbers into AutoCAD layer names. Each line thereafter controls layer mapping and contains three strings. The first string is the AutoCAD layer name. This must be followed by one or more spaces. The next string is the EGS layer number. This must be a number between 1 and 256. If this keywords is not present DXF2EGS will simply map each AutoCAD layer into the EGS layer number in the order the AutoCAD layers were created.

This function also works in reverse for DXF2EGS so can be used to preserve layer name vs. number correlation for round trip translations.

The third string is the DXF layer color number; this enables the user to control which colors appear on the AutoCAD screen.

Example

```
Layer  
0          100  
SEG        1  
DEFPNTS    9
```

LAYFILTER

ON/OFF

When ON, all unused layers defined in the process file will be filtered out of the DXF layer table. This is very useful when translating files that have 256 layers defined in EGS but actually only use a couple of these layers.

Example

```
LAYFILTER  
ON
```

SHATCHWIDTH

polyline_width

This parameter is used to specify the width of the DXF polyline used to simulate solid hatching.

Example

```
SHATCHWIDTH  
0.005
```

TOPBLOCK

ON/OFF

When off (default), the top instance is exploded. This is preferred by most autoCAD users. When on, the top instance is preserved.

Example

```
TOPBLOCK  
ON
```

TSCALE

text_X_scale

The TSCALE factor multiplies an AutoCAD text string scale factor by the number indicated. This scale factor has been introduced because EGS text fonts often have a different height to width ratio than AutoCAD fonts. The result is that text that fits fine in AutoCAD appears too spread out in EGS and vice versa. By using a scale factor smaller than 1 the EGS text will occupy about the same horizontal space as the AutoCAD text. It will be smaller in height than the AutoCAD string but this cannot be helped because of the different fonts used in the two CAD systems.

Example

```
TSCALE  
0.8
```

TEXTFONT

text_font_name

This option controls the SHX file used in the DXF file for EGS TEXT. If not present the font file defaults to "txt."

Example

```
TEXTFONT  
romant.shx
```

NOTEFONT

text_font_name

This option controls the SHX file used in the DXF file for EGS NOTES. If not present the font file defaults to "txt."

Example

```
NOTEFONT  
Simplex.shx
```

DIMFONT

text_font_name

This option controls the SHX file used in the DXF file for EGS DIMENSIONS. If not present the font file defaults to "txt."

Example

```
DIMFONT  
Hb-1d.shx
```

Error Handling and Reporting

EGS2DXF may encounter a problem in translating an EGS file into DXF. For example, if the EGS file is missing the process header you would see:

```
Error detected. Program stopped without writing a DXF File  
Process header missing.
```

In addition to displaying the error message on the screen, the error is also written to a file ending in .err with the same name as the EGS file name.

Loading the DXF File into AutoCAD

EGS2DXF produces an AutoCAD DXF file. The file is compatible with AutoCAD releases 9 and 10, 11 & 12. To load the DXF file into AutoCAD do the following: (for the DXF file called amp.dxf)

Start a new drawing from the AutoCAD Main Menu.

```
1. Begin a NEW drawing
2 Edit an EXISTING drawing
3.
4.
5.
6.
Enter Selection:1 [enter]
Enter NAME of drawing: amp [enter]
```

Once the drawing editor has come up type:

```
Command: dxfin [enter]
File name <AMP>: [enter]
```

After a short time AutoCAD will display your drawing. You may need to zoom extents to see your drawing.

Problem With Invalid Blocks?

If instead of seeing your drawing on the screen you get the following error message:

```
Command: dxfin [enter]
File name <AMP>: [enter]
Not a new drawing..only ENTITIES section will be input.
Undefined block PGCUPI2
*Invalid *
```

What has happened is that your new AutoCAD drawing was not empty, probably due to the fact that the AutoCAD prototype drawing (ACAD.DWG) has data in it already. AutoCAD won't read in any block data into a drawing that is not completely empty. When starting your new drawing do it as follows:

```
Enter Selection: 1 [enter]

Enter NAME of Drawing: amp= [enter]
```

The equal sign (=) tells AutoCAD not to load ACAD.DWG as the prototype drawing. Your DXF file will successfully load in.

EGS Process File Header

When creating the EGS archive file you must include a process file header . This is done by specifying the :P option as part of the archive command. EGS2DXF uses the following parameters in the process header:

DECIMALS	Controls the number of significant digits in the DXF output.
DIM_EXTEND	Controls the dimension extension line spacing.
DIM_FSIZE	Controls the dimension text size
DIM_TSLANT	Controls the slant angle of dimension text
FSIZE	Controls TEXT and NOTE font size
GRID	Controls significant digits in data output. Egs2acad looks at both DECIMALS and GRID values and takes the higher resolution.
TSLANT	Controls the slant angle of TEXT/NOTES.
WINDOW	Used to control the default size of dimension arrows. The user can modify this value with the EGS.CFG parameter ARRSCALE.
EQU	Used to build the AutoCAD layer table. Picks up layer number and linetype information.
\$FILES	Used to build the DXF block table.

Chapter 4

Translating DXF Files into EGS Archive

The program DXF2EGS translates an AutoCAD DXF file into an EGS Archive file. The program is not limited to DXF files created by AutoCAD. Almost any DXF file created by a variety of PC based CAD systems can be read into EGS using the translator. AutoCAD revisions 9, 10, 11 & 12 are supported; no 3D information is converted as EGS is a 2D drawing system.

Running DXF2EGS

Check that the EGS.CFG file is present on your default drive and directory. At the prompt type:

```
dxf2egs [enter]

DXF2EGS Converter Version 6.15 Key 8526 0014
Copyright 2002, Artwork Conversion Software, Inc. (831) 426-6163
Enter file name [.DXF]: display [Enter]
Output file name <display.egs.: [Enter]
Reading HEADER SECTION
*****
Reading TABLE SECTION
*****
Reading BLOCK SECTION
*****
Reading ENTITY SECTION
*****

Errors Detected
Press (CR) when ready
```

In this example the message at the end of the translation “Errors Detected” was flashed on the screen because the translator detected an illegal name during translation. The name DISPLAY is an EGS keyword. The translator automatically converted this to I_DISPLAY. To see the nature of the error look for the file called DISPLAY.ERR

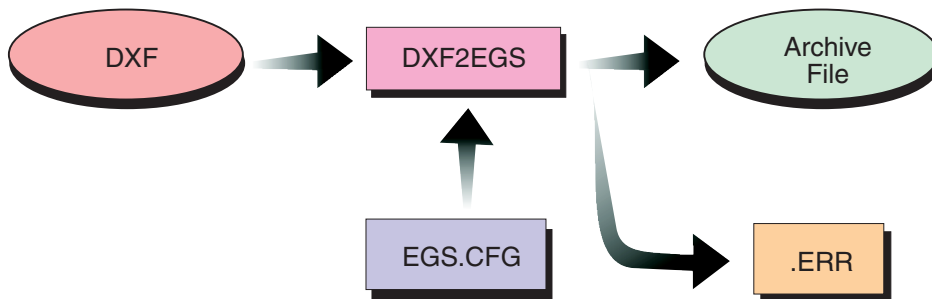


Figure 1-4. Flow of DXF2EGS translator

The DXF2EGS Command Line

DXF2EGS can be run from the command line without any prompts if the input and output filename are supplied as parameters. The correct format is:

```
dxf2egs [inputfile[.dxf] [outfile[.egs]] [options]
```

where

inputfile	name of the dxf file to translate. The extension .dxf is assumed unless otherwise specified.
outfile	name of the EGS Archive file to create. The suffix. Egs is used unless otherwise specified.
options	
-use_equate	uses the equate section from an external process file specified in the EGS.CFG file.
-add_equate	uses information in the equate section from an external process file in addition to the equ entries created by scanning the DXF file.
-graffy	allows block names of up to 32 characters. Without this option long block names are truncated to 8 characters.

The Configuration File EGS.CFG

When DXF2EGS starts up it reads configuration information from a file called EGS.CFG. The EGS.CFG file should be created or modified by the user with an ASCII text editor to control the translation process prior to running DXF2EGS. Once the EGS.CFG file has been correctly configured it is normally not necessary to modify it again.

Location of the EGS.CFG

DXF2EGS searches for EGS.CFG first in the current working directory. If not found there, it then looks in the directory where the program exes are stored.

Default Assumptions

If EGS.CFG cannot be found the program will make the following assumptions:

UNITS of the DXF drawing are in INCHES
EGS resolution should be 1000 (i.e. .001 inch)
All DXF text styles are mapped to EGS NOTES
AutoCAD Layers are mapped to EGS layers in the order created.
TEXT SCALE=1

EGS.CFG Keywords

Basic Syntax

All keywords must be in upper case (also on UNIX versions of the software) and should start in column 1 of the file. Anything in the EGS.CFG file that is not a keyword is ignored. The parameters that follow the keyword must follow immediately after with no intervening blank lines.

UNITS

```
UNITS
10000
INCH
```

Sets the units and resolution for the EGS file. The 2nd line contains the number of database units per user unit. The 3rd line contains: UM, MICRONS; MM, MILLIMETERS; CM, CENTIMETERS; METRE, METERS; UINCH, MICROINCH; INCH or MIL. In this example the EGS drawing will be in inches with .0001 resolution.

TEXT

```
TEXT
STX
STY
```

Keyword controls which AutoCAD text styles are mapped to EGS TEXT entity. Any style not mentioned here will be mapped to EGS NOTES entity. In this example, the DXF styles STX and STY are mapped to EGS TEXT. Any other styles used, such as "STANDARD" will be mapped into EGS NOTES.

ARCRES

```
ARCRES
4
```

Arcres controls the value of resolution passed to the EGS process file. EGS uses this information to determine how accurately to display circles and arcs on screen. In this example a value of 4 degrees is inserted in the EGS process file header. Default is 4 degrees if this keyword is not present.

LAYER

```
LAYER
0          100
SEG        1
DEFPNTS    9
```

The layer keyword is very powerful and is used to map AutoCAD layer names into EGS layer numbers. Each line controls layer mapping and contains three entries. The first item is the AutoCAD layer name. This must be followed by one or more spaces. The next item is the EGS layer number. This must be a number between 1 and 256. EGS does not allow any data to be mapped into EGS layer 0 (zero.) Therefore data drawn on AutoCAD layer 0 will never show up on EGS layer 0. You should either avoid drawing anything on layer zero or map it to some other layer. In this example data on layer zero has been mapped to EGS layer 100. IF this keyword is not present DXF2EGS will simply map each AutoCAD layer into the EGS layer number in the order the AutoCAD layers were created.

This function also works in reverse for EGS2ACAD so can be used to preserve layer name vs. number correlation for round trip translations.

MAXERR

MAXERR

25

This is the maximum number of errors allowed by DXF2EGS before aborting. As DXF2EGS encounters errors, it writes the error message to a disk file. If more than MAXERR number of errors is encountered the program will stop. Typical errors are layer or block names using reserved EGS keywords.

TSCALE

TSCALE

0.8

The TSCALE factor multiplies an AutoCAD text string scale factor by the number indicated. This scale factor has been introduced because EGS text fonts use a 1:1 ratio for height:width of each character. AutoCAD fonts usually have a ration of 7:5 for height:width. The result is that text that fits fine in AutoCAD appears too spread out in EGS. By using a scale factor smaller than 1 the EGS text will occupy about the same space as the AutoCAD text. It will be smaller in height than the AutoCAD string but this cannot be helped because of the different fonts used in the two CAD systems.

PROCESS

PROCESS

EGS.PRC

This keyword causes the text file name that follows to be appended to the process file header created by DXF2EGS. DXF2EGS already creates a process file header. However, under some cases the sophisticated user may wish to use different parameters or additional parameters not created by DXF2EGS. In this case he/she could create their own process file header and have it included automatically by DXF2EGS. Doing this requires understanding of the EGS process file header and should only be done by the sophisticated user as no error checking is performed to insure that the EGS.PRC file is valid.

Sample EGS.CFG File.

```
UNITS
1000
INCH

Layer
0          100
METAL     4
POLY      5
RESISTOR  6

TSCALE
0.8

TEXT
STANDARD

MAXERR
25
```

Translation Table: DXF to EGS

AutoCAD's DXF and HP's EGS Archive files share many similar entities. This section summarizes how items are translated and which items are not supported.

AutoCAD Entity	EGS Entity	Comment About Translation
Line	Lines	
Arcs	Arc	
Layer	EQU Layer	The Layer name is lost. The layers are mapped into EGS in the order that they were created in the order that they were created in AutoCAD if no EGS.CFG file is present. The user can edit an EGS.CFG file to control mapping of AutoCAD layers into EGS layers. Note that layer 0 in EGS is reserved.
Zero Width Open Polylines	EGS Line	
Polyline with constant width	EGS Line with Width	
Polyline of varying width	EGS Polygon	

AutoCAD Entity	EGS Entity	Comment About Translation
Zero width closed polyline	EGS Polygon	
Solids	EGS Polygon	
Circles	Circles	
Hatching	Supported	The AutoCAD defined hatch block is translated into an EGS instance and inserted.
Dimensioning	Supported	Each dimension block becomes an instance in EGS. Dimension text is mapped into EGS Notes. The actual lines and polygons and text are not mapped into layer 0 as in AutoCAD but appear on the intended layer.
Block and Block Inserts	Supported	Blocks are mapped into EGS Instances. Block insertions are mapped into EGS instance insertions. Blocks can be nested up to 10 deep. Insertions can be rotated and scaled but the scale factor for x, y and z must be the same. Block attributes of the constant type are supported. Multiple insert is supported.
Text	Supported	Text insertions can be mapped to either EGS Text or EGS Notes. Insertion Height, Rotation and mirroring are supported. Text font information is not supported. Slant and width parameters are ignored. Extended characters, plus/minus, %%p, %%u, toggles underline mode, %%o toggles overline mode, %%d degrees symbol. Text width factor and obliquing are not directly supported.

DXF File Restrictions

- No Polyline may have more than 1024 vertices.
- Maximum number of layers is 256.
- Maximum number of block definitions is 512
- No block, layer, style, or file name can be the same as any EGS reserved keyword. EGS would interpret such an entity incorrectly. (See the list at the end of the section.)
- Block names should be unique in the first 8 characters. EGS supports only 8 character instance names; characters beyond the 8th are truncated. Graffy supports block names up to 32 characters.
- Blocks should not be inserted with different x & y scale factors; EGS does not support instances with different scale factors. The data will be translated using only the X scale value and the output will be distorted.
- When creating the DXF file make sure that AutoCAD (or other CAD program) creates a header including a layer table, text table and block tables. Do not attempt to output binary DXF files or DWG files.

Entities and Attributes Not Directly Supported

Certain entities and entity attributes are not supported:

Linetype/Color by entity	Assignment are ignored. This is because EGS assigns linetypes and colors by layer only. You should set entity linetype and color to “bylayer”
Closed plines with width	Closed polylines with width may not always translate as expected. This is because EGS has no equivalent entity. The program has to decide whether to use the EGS polygon entity or the EGS line entity with width.
Shape Files	Shape files, such as those used for electronic schematics, are not translated and have no equivalent in EGS. If these can be realized as blocks then they can be passed to EGS.
3D entities	No 3D entities are supported. Most 3D entities are ignored and a 2D translation is made.

Reserved Keywords in EGS

The EGS CAD system reserves certain keywords for commands, special functions and macros. Using these keywords for DXF filenames, blocks, layers, styles or fonts would create an illegal EGS archive file. DXF2EGS tests for known EGS key words. The list below contains all of the strings that DXF2EGS tests to insure that no keyword is used. EGS also recognizes abbreviations of keywords. EGS only looks at the first 6 characters to check a keyword. Therefore DISPLAY is an illegal keyword even though only DISP and DISPLA are shown in the list.

This list is not exhaustive because each EGS user can define additional reserved keywords for macros.

A C D H L M O P R T N

ADD ARC ARE BAC CAL CAT CHA COP CUR DAT DEC

DEF DEL DIM_D DIM_DI DIM_E DIM_F DIM_R DIM_S DIM_T DIM_TS

DIM_U DISP DIST DUM ECH EDI ENT EOC EQU EVA EXI

FIL FSI GAT GEN GRI GRO HEL IDE INA INP LEV

LIS LOA LOCA LOCK MEM MEN MOD MOV NOP PAC PAG PAU

PLO POI PRE QUI REM RES RET REV SAV SEA SET SHO SMA SMO STE STR

TME TNA TSL UND UNI VOL WIN WRA

ARCHIV AREA VACK_U CALIBR CATALO CHANGE COPY CURSOR DATUM

DECIMA DEFINE DELETE DIM_DE DIM_DI DIM_EN DIM_FS DIM_RA DIM_SC

DIM_TF DIM_TS DIM_UM DISPLA DISTAN DUMP ECHO EDIT EQUATE EVALUA

EXIT FILECO FSIZE GATHER GENERA GRID GROUP HELP IDENI INAME INPUT LEVEL

LIST LOAD LOCATE LOCK MEMORY MENU MODIFY MOVE NOP PACK PAGE PAUSE

PLOT POINT PREFIX QUIT REMOVE RESOLU RETRIE REVISI SAVE SERACH SETOFF

SHOW SMASH SMOOTH STEP STRETC TMENU TNAME TSLANT UNDO UNITS VOLUME

WINDOW WRAP COLOR LNTYP BOTH ALL EOC ENT FIT ZOOM PAN LAST LINE RECTAN

NOTE ARCS DIMEN INSTAN OVAL HATCH TEXT CIRCLE MARKER POLYGO PHANTO

Appendix I

Technical Support

If you have problems running our software please contact us so that we are aware of the types of problems you have encountered and can correct them. We also encourage suggestions about new features.

Artwork Conversion Software, Inc.

417 Ingalls St.

Santa Cruz, CA 95060-3500

Tel (831) 426-6163

Fax (831) 426-2824

Email

You can contact us at support@artwork.com

This email address is distributed to several users. You can attach small files to your email. If your attachments are large, we prefer that you ftp them to us. If you do attach files please use MIME attachment so that we can automatically detach them.

WEB

We maintain an information area at <http://www.artwork.com>. In addition to the basic datasheet, there is a page that reports the upgrade revision status, and a method of picking up the latest release for registered users. We suggest that you visit the WEB site regularly. A new page for each product: Frequently Asked Questions (FAQ) will be in place.

FTP Site

We prefer that you send us problem files or examples via ftp. The procedure is as follows:

- 1.) Gather the relevant files together (mask files, dxf, gerber, aperture list etc...)
- 2.) Create a readme.txt file identifying yourself, your phone, fax and describing the problem. Files sent to us without a readme.txt associated with them are deleted!
- 3.) Compress the files into a single zip file using PKzip, Winzip or equivalent. If you are worried about privacy or security you can use a password and send us the password by email, voice or fax. If your coming from a UNIX system you can also use gzip or tar and compress.
- 4.) Never send us a self extracting archive ending in .exe. We delete these files immediately - too much risk of a virus.
- 5.) ftp the file to us at ftp.artwork.com - follow the directions on the next page.

FTP Directions

Login = anonymous

Password = email address

Change directory to pub/put_in_here

Change to binary mode and put the file in this directory

We also place updates and newly released software on our ftp site. It is accessible both via the WEB page and directly. Files for download are available from the get_from_here directory.

Sample ftp dialog - dropping off a file

```
ftp: ftp.artwork.com           IP = 128.242.120.83
login: anonymous                only anonymous login is allowed
password: your_email_address
> cd pub/put_in_here           We've set up a special directory to put
                                stuff to us.
> binary                        set ftp's transfer protocol to binary
> put filename.zip             put the desired file zip file.
> bye                           sign off.
```

Picking up files from the ftp site

```
ftp: ftp.artwork.com           artwork.com's IP address is 128.242.120.83
login: anonymous                only anonymous login is allowed
password: your_email_address
> cd pub/get_from_here/mtools  under get_from_here are various
                                directories of interest to us.
> binary                        set ftp's transfer protocol to binary
get mtools.sunos.v209.zip       all files are zipped using a password
                                you will need to contact artwork by mail
                                to obtain the unzipping password.
>> bye                           sign off.
```


WEB Support

Updated Software can be easily downloaded

Manuals in PDF format can be downloaded and printed

The web address for this program is <http://www.artwork.com/gdsii/gdsplot/index.htm>

What's the Current Version of the Software?

Go the home page and click on the category for your software. You will find an index page for your program with an entry called Revision History. Click on Revision history and you will find the version number, date and a list of bug fixes or enhancements.

Download the most Recent Version

If you decide that you want to update you can download the latest version with a click.

Installs are password protected. You need to email us (support@artwork.com) to get the installation password. At that time your support status will be checked and only customers under support are given the password.

Technical Bulletins and Solutions to Common Problems

There is a support page (www.artwork.com/support/index.htm) where we've tried to post detailed bulletins on the most commonly asked questions and problems. These solutions are normally done in HTML and soon will be available in PDF.

ZIP Compression

Most of the UNIX files we make available on our ftp site are compressed using the ZIP protocol. UNIX users can download by anonymous ftp the ZIP programs. Don't attempt to download UNIX files onto a PC and unzip them there - the filenames will generally be modified and the install will no longer work.

<code>/pub/get_from_here/util/sunos_zip.tar</code>	for SunOS 4.1.x
<code>/pub/get_from_here/util/solaris_zip.tar</code>	for Solaris 2.x
<code>/pub/get_from_here/util/hp700_zip.tar</code>	for HPUX 9.0x

You can install these in your `usr/local/bin` directory so that they are easily accessible.

Our zip files are password encrypted - to unzip them you must provide the correct password. The password changes regularly. Please call or email us to obtain the password.

Many public domain versions of unzip such as `gzip` do not support passwords. If yours is such we recommend that you download the ones we have provided.

For program updates you must be under support to obtain such a password.

