

The New & Improved DWG/DXF Translator

The Expert Infocad DWG/DXF Translator is simply the best translator for moving data from one cad system to another available anywhere. This powerful tool not only translates the actual data from one file type to another, but also has many customization tools which allow you to fine tune the translation to include drafting standards, such as colors, pens/colors, pens/line width, layer names, RI names, text fonts and patterns between ARRIS / BuildersCAD and DWG or DXF. This year there are several new features to make translation even easier and more seamless. Also presented will be some of the issues & pitfalls to avoid in data exchange in general.

Most Recent Features added to the Expert Translator for ARRIS and BuildersCAD

R7.6 supports all the currently available ARRIS, BuildersCAD and AutoCAD versions and Releases, as of January 2007. The Subscription Program is a rolling supports for all coming releases and enhancements for the two CADs for one year.

Each of the Translator releases normally has about twelve spins. Each spin normally fixes the bugs discovered by the ARRIS and BCAD users and also add one or more enhancements requested by the users. The most recent major enhancements added to the Expert Translator are listed below - regardless in what release they were added – and are further described in the manual.

A- Automatic recalculation of the DWG Maximum and Minimum Extents, if the coming DWG contains wrong values.

[Enhancement requested by Mike Polley]

Many DWGs comes with their Maximum and Minimum Extents set to a very large +ve or –ve values. This is due to when the AutoCAD user never used the AutoCAD command ZOOM -> Extents which set these values, or the DWG was produced by a third party program that does not set these Extents values or when the DWG was has been created by a third party developer and the Extents have not been calculated. The drawing Extents is needed by the Translator to calculate the db increments, which is important for ARRIS pre-release 8.0 and for the display list creation for all ARRIS releases including ARRIS 9.0 and 9.1.

The Translator release 7.511 and up, now automatically recalculates the drawing Maximum and Minimum Extents, if the User requested db increments (or the

default db increments) cannot be used with the DWG own Min or Max Extents values.

B- The ARRIS arcs and circles have a property called “Circle Direction”. Now the Circle-Direction sets the Extrusion Direction of the produced AutoCAD Arc or Circle entity, regardless on how the three points of the entity are stored in CW or CCW direction in the ARRIS database.

[Enhancement requested by Walt Zapor]

ARRIS arcs and circles have a property (flag) called “Circle Direction or [Dir]”. Its is the flag ‘#fcrdir’ that shows how the circle or the arc should be constructed during producing the displayed entity. In reality ARRIS constructs and saves the three points that define an arc or a circle in the order they were entered by the end user during creating the entity, no matter how they were entered by the end user in a CW (clockwise) or CCW (counter clockwise) manner. The Translator calculates the OCS Object Coordinate System¹ - also called Entity Coordinate System or ECS - based on how the entity is constructed and saved in the database which is a mandatory requirement by AutoCAD. This method will produce a positive Extrusion Direction in the Z value if the three points saved in the database are ordered in a CCW value and a negative Extrusion direction in the Z value if the three points saved in the database are ordered in a CW value; no matter how the flag #fcrdir is set.

The Translator release 7.511+, now matches the true direction of the database arc or circle according to the values of the three database points of an arc or a circle with the value of saved in the flag #fcrdir; and if they are different, these three points are re-order to give a CW or CCW value equivalent to the value of the flag ‘#fcrdir’. With this new method, the ARRIS user is advised to change the circle-Direction [flag #fcrdir] to all the arcs and circles in his 2D drawing to CCW so they will be compatible to AutoCAD where all arcs and circles are CCW, specially if the produced DWG drawing will be used by civil engineers or by third party programs, where all the arcs’ OCS should all be consistent, to produce accurate results.

Translated ARRIS database to AutoCAD drawing will have the following results:

Viewing the Drawing from the Top (View -> 3D Views- > Top)

- 1) ARRIS Circles and Arcs are translated as AutoCAD Circles and Arcs respectively.
- 2) ARRIS Polygons are translated as AutoCAD 2D Polylines. The Polygons’ OCS have remained – without change - equivalent to the ARRIS circle’s points as saved in the ARRIS db.

3) ARRIS Arcs and Circles with Circle-Direction = CCW will have all their AutoCAD OCS with a +ve value in Z direction (X= 0'-0" Y= 0'-0" Z= 0'-1") and OCS is not displayed by LIST (query) as this is the current UCS.

4) ARRIS Arcs and Circles with Circle-Direction = CCW will have all their AutoCAD OCS with a -ve value in Z direction (X= 0'-0" Y= 0'-0" Z= -0' 1")

View the same Drawing from the Bottom (View -> 3D Views -> Bottom) will reverse the Z value of the OCS as follows

1) ARRIS Arcs and Circles with Circle-Direction = CW will have all their OCS with a -ve value in Z direction (X= 0'-0" Y= 0'-0" Z= -0'-1")

2) ARRIS Arcs and Circles with Circle-Direction = CCW will have all their OCS with a +ve value in Z direction (X= 0'-0" Y= 0'-0" Z= 0' 1"). and is not displayed by LIST (query) as this is the current UCS.

Conclusion:

1) ARRIS Arcs and Circles with CCW circle-Direction can be accurately edited in AutoCAD with Top View (WCS).

2) ARRIS Arcs and Circles with CW circle-Direction can be accurately edited in AutoCAD with Bottom View.

Suggested Enhancements:

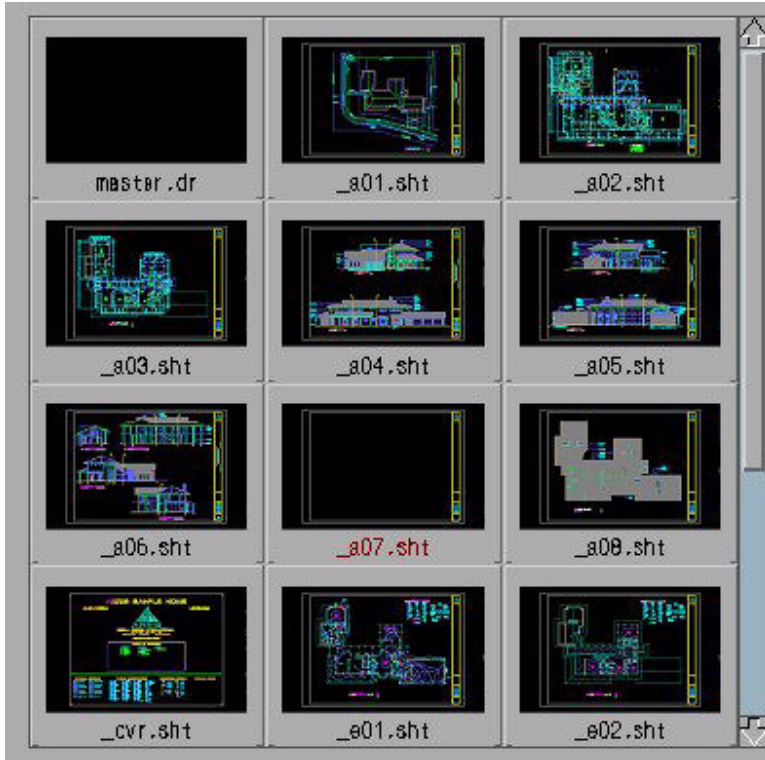
We can add – if requested - a new Translator User's Configuration Option to translate all Arcs and Circle as having a CCW Circle-Direction. This may be useful for surveyors drawing and Architectural plan.

Translating multiple ARRIS sheets into a single DWG drawing:

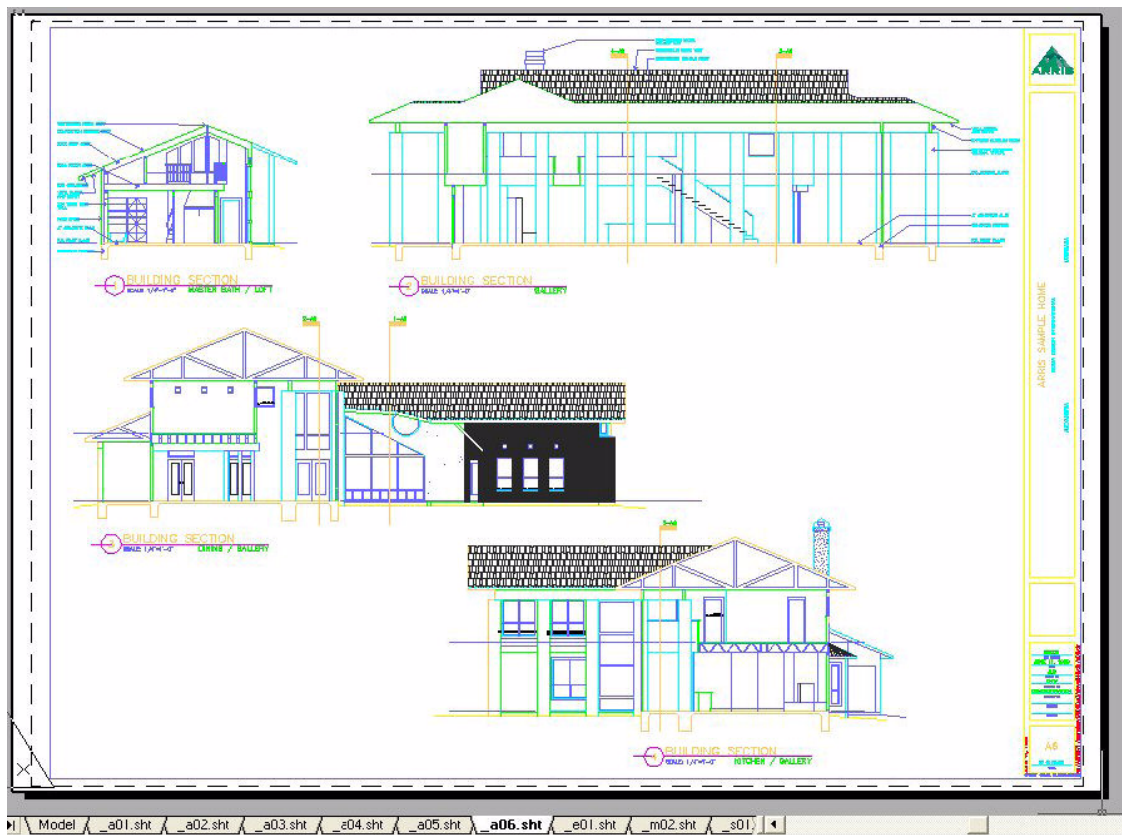
[Enhancement requested by Wim Benes and others]

The User interface is as follows:

1) A File called Sheet-Set with extension .shtset will be automatically created (or can be manually created by the user) and its name will be sent to the Translator as a parameter. I am forced to use this scenario because the ARRIS \$utilities \$npipe, \$import and \$export have limited number of constant fixed parameters and cannot accept a list of sheets as parameters. The long extension .shtset was also mandatory as all file extensions with 2 or 3 characters are already reserved by so many popular programs and are saved in the PC Registry and will cause problem if used. The Sheet-Set file should be located under the database directory. The sequences to Translate (Export) a plurality of sheet-Set to an AutoCAD Dwg file is as follows (continues in page 3):



Plurality of ARSIS sheets Translates to one DWG



a) First, from inside ARRIS/BCAD graphics download the new 'Expert Translator R7.6' from the ARRIS Plug-in Modules', then From ARRIS 'File-Menu' >> 'Export' >> 'ARRIS to DWG' >> 'ARRIS Translator DWG' >> You will be prompted to select from the following choices as shown in fig 1 below:

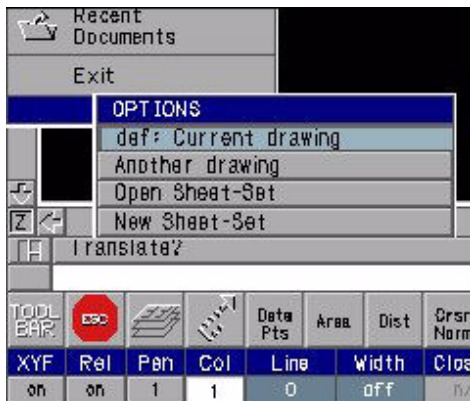
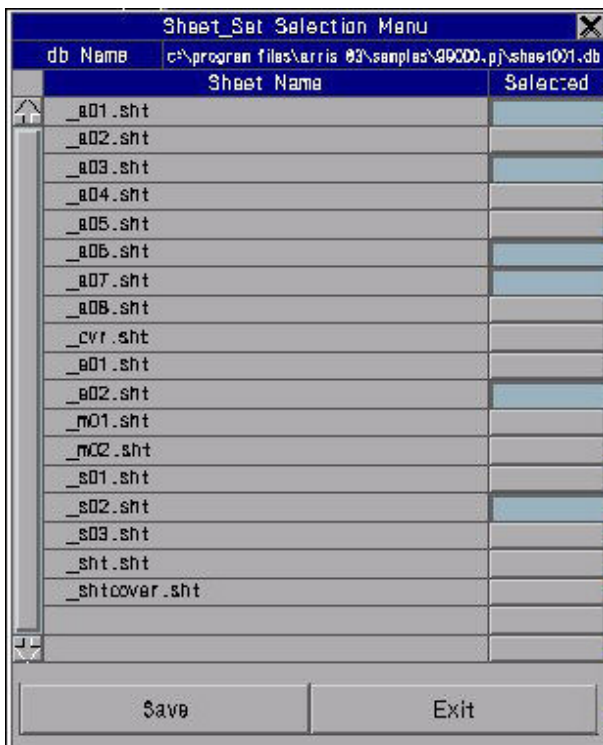


Fig. 1: Export choices

i) *New Sheet-Set*: A Pop-up – shown in Fig 2 below - with the list of the available sheets in the current db displays; and you can select - to highlight - the sheets you want to incorporate into the Sheet-Set file to Translate. You will be prompted for a name for this sheet-set file; an extension .shtset will be appended. It will be saved in the db directory.



- ii) *Open Sheet-Set*: Will let you select an existing sheet-set file (.shtset) –previously saved inside the db directory - to translate.
- iii) *Another drawing*: Will let you select the usual dr or sht file to translate.
- iv) *Def: Current drawing*: Will translate the currently loaded drawing or Sheet.

b) Follow the instruction in the main Translator Pop-up as usual the select 'Start Translation' to complete the translation.

It is to be noted that translating a sheet-Set will create a DWG file with much larger DWG size depending on the number of ARRIS sheets you want to incorporate in this DWG. Computer (PC) with large enough RAM and free space on the hard disk may be required. A work around for very large produced DWG is to perform the translation from the Operating System, to save the memory that ARRIS and the loaded db are consuming. It is also to be noted that the new 'RI-Patterns' mapping described below can save up to 50% of the size of the DWG produced, so it is recommended to use it especially for very large DWG files.

Translation Mode	
SHEETSET2DWG	SHEETSET2DXF
ARRIS2DWG	ARRIS2DXF
DWG2ARRIS	DXF2ARRIS
DWG2ARRIS AND LOAD	
DXF2ARRIS AND LOAD	
\$HP2LT	\$HX2LT
LT2SHP	

Fig 3: The new Translation Modes with the Sheet-Set

Bidirectional Mapping of the ARRIS RI-Patterns to the AutoCAD Patterns:

[Option requested by Robert Trinidad]

Two new Options in both the In and Out Translation Configuration, that are saved .icf & .ocf files respectively, are shown below with their default value:

MAP RI PATTERNS TO AUTOCAD PATTERN = YES
 USER RI PATTERNS MAP FILE = STANDARD_MATCH

The following are the main characteristics of this new RI-Pattern Mapping:

1) *The 'User RI Pattern Map' file has the following format:*

```
AUTOCAD = ARRIS
AR-CONC = j_pat22
AR-SAND = x_pat24
AR-SAND = j_pat24
AR-SAND = n_stipple
AR-BRSTD = j_pat10
```

2) *AutoCAD Hatch patterns file*: The hatch patterns used by AutoCAD are stored in only two files: the acad.pat file for English Units and acadiso.pat for Metric Units. The user can add pattern definitions to either file (AutoCAD can also have other user-defined patterns files, but they are limited to have just one pattern

defined per file. This limitation makes it impracticable and not used by AutoCAD users, except for testing new patterns). Currently the Translator necessitates the existence of the corresponding acad.pat or acadiso.pat file in order to read the geometry of the patterns that are used to properly define the Hatch Entity inside the DWG file. These two files are ASCII Files and are Copyright protected by AutoDesk, so I am not sure until now if Sigma Design or I can add them to the Translator package or to the ARRIS package. These two files are stored within the AutoCAD installed program directory in a subdirectory called support/ - for example "C:\Program Files\ACAD2000\SUPPORT". To get access to these two files during the Translation process there are three methods:

a) To have a AutoCAD program properly installed on your PC. The Translator will read the PC Registry to get the location of the AutoCAD support directory that contain these two files. For AutoCAD R2004 and higher the support directory is located under the "My Documents" directory somewhere and its location is saved in the PC Registry. The translator will locate it and you do not have to do anything.

b) Ask your consultant to send to you one or both of these two files, especially if these files are customized by the end-users. Or get a customized copy of these two files from the Internet (there are so many of them) then put it/them in any directory and define that directory by the variable 'ACADRESOURCE' in the file \$ARRIS\etc\acad.ini - as follows:

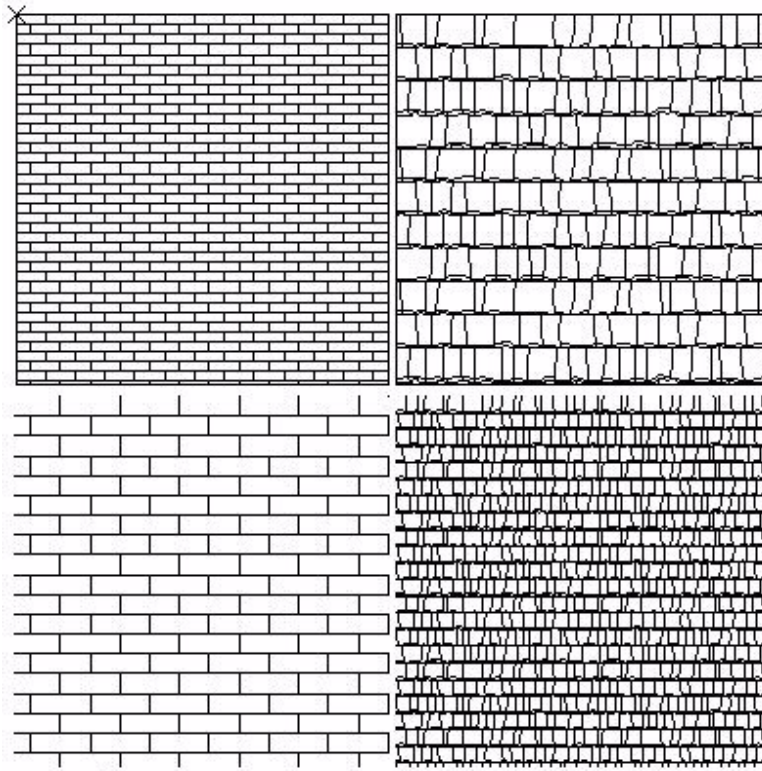
ACADRESOURCE = <path-to-that-directory>

c) If you have AutoCAD installed somewhere on the network and not on your computer then define the network path to the AutoCAD support/ directory in the acad.ini file as explained in b) above.

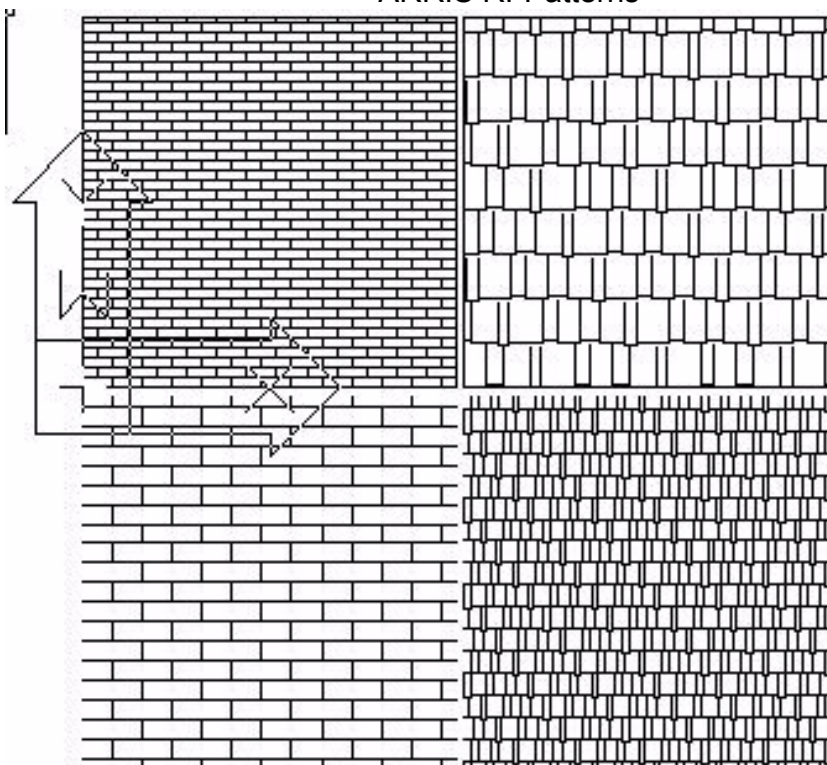
3) It's up to the end-user to match the RI-Pattern to the required Acad pattern. They both should have been drawn or defined with the same size (X and Y length). Normally the AutoCAD patterns whose names have the prefix AR- (for Architecture) have the same size (length) as ARRIS RI-Pattern and can be used safely in mapping the common ARRIS system RI-Patterns.

4) AutoCAD has a single scale and a single rotation for the Hatch's Pattern Fill - i.e. X, Y and Z scales are the same and the Z rotation is only used as the Hatch rotation. In ARRIS the RI-Pattern can have different X, Y and Z scales and different X, Y and Z rotations. The Translator, during exporting the db to AutoCAD, calculates the average of the X and Y scales and uses it as the AutoCAD Hatch scale. For the rotation the Translator uses the Z rotation for the AutoCAD hatch rotation.

5) Similarly Entities' RI-pattern Scale and Rotation are translated properly to/from AutoCAD Hatch Scale and Rotation Entities' RI-pattern Scale and Rotation are translated properly to/from AutoCAD Hatch Scale and Rotation. Hatch pattern angle (pattern fill only) Hatch pattern scale or spacing (pattern fill only) (cont p6)



ARRIS RI-Patterns



Autocad Patterns

6) If the 'User RI Patterns Map File' option is set to 'Standard_Match' then the program will use the map saved in a file whose name is 'standard_match.xhm'. A sample of this file is found in the directory:

"\$ARRIS ap\infocad.vn\dwg.ap\samples\". It is the responsibility of the end user to prepare this file and put it in a visible directory—for example the std:trans.dir\. With the help of the end-users, we plan to prepare a 'standard_match.xhm' file that maps most of the common ARRIS RI-Patterns with their equivalent AutoCAD Patterns. Creating new AutoCAD Patterns for the common ARRIS RI-Patterns or new ARRIS RI's equivalent to the AutoCAD common Patterns are two options that will facilitate making this list as complete as possible.

7) Extra (bonus) benefits of this RI-Patterns mapping are as follows:

- a) Produces much smaller DWG files according to the RI-Patterns usage in the ARRIS db. Up to 50% saving has been noticed.
- b) Increase the Translation performance.
- c) The coming AutoCAD Hatches in ARRIS looks much better.
- d) The Buggy ARRIS Hatch (known permanent bug in ARRIS 8) translates properly in AutoCAD as most of the corrupted flags values that describe the Pattern geometry are replaced by just the Pattern name to get a new definition in AutoCAD. The same thing may applied to AutoCAD to ARRIS Translation.
- e) Round trip translation for the Hatch made possible.

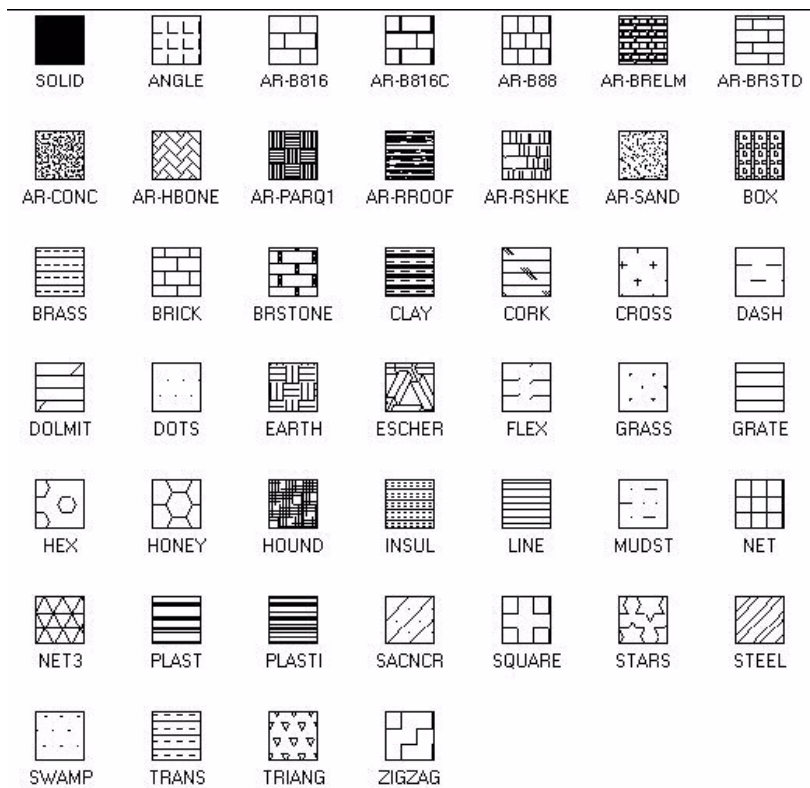


Fig. 5: Pre defined Autocad Patterns

Automatically Translating the non-bound Xref Blocks and all their in-Depth Xrefs - within an AutoCAD DWG - to a single RI with its RI-Occurrence in the produced ARRIS database:

[Option suggested by Salleh Diab]

You do not have to bind all the Xreferenced Blocks and all their nested Xreferenced blocks to the main AutoCAD DWG drawing - you want to translate - before translating a DWG to ARRIS. The Translator will take care of all the Xreferenced DWGs and all in-depth Xref blocks at run-time during the Translation if these DWGs are available. All the Xreferenced DWGs will now be converted in memory to standard local block definitions and then translated to ARRIS RIs. This will also take care of all the xref and all their dependent symbols to become a part of the current translated ARRIS drawing. The translator will translate the individual xref-dependent symbol table definitions, such as blocks, text styles, dimension styles, layers, and linetypes, to the local symbol table; and translate them all to the ARRIS drawing. All the original DWGs remains unchanged.

An init file for the Translator to customize the Translator Variables you want to display Translator Pop-up at Start-Up:

[Option requested by Wim Benes]

A new file 'etrans.ini' for both Windows and Unix is added to the directory:

\$ARRIS\ap\infocad.vn\dwg.ap\etrans.ini or

\$BCAD\ap\infocad.vn\dwg.ap\etrans.ini

This file is similar to the file \$ARRIS\etc\arris.ini but for the Translator. All the settings written in that files will become the default settings in the Translator Main Pop-Up Menu.

A copy of the file is as follow:

```
##### EXPERT TRANSLATOR Init file #####
# Please edit that file with your requirements
# location: $ARRIS/ap/infocad.vn/dwg.ap/etrans.ini
# Customizes the variables you want to display for the Translator POP
# UP Menu at start-up
# Lines starting with '#' are comments
# All variables are Case Insensitive for example 'LOGFILEMODE = NO' is
# the same as 'Logfilemode = No'
# IN_ARRIS_VER: Set the Version for the newly created ARRIS/BCAD db
# when importing a DWG drawing
# Legal values are: 60, 70, 2001, 80, 81, 82 and 83
# Example: IN_ARRIS_VER = 82
# OUT_DWG_REL: Set the Release for the newly created DWG/DXF when
# exporting an ARRIS drawing,
# sheet or sheet-Set
# Legal values are: 12, 13, 14, 2000, 2004, 2005 and 2006
# Default value is 2000
# Example: OUT_DWG_REL = 2000
# OUT_DWG_DIR: Full path for an existing Directory where you want to
# store the created DWG files
# Default value is the db directory or the working directory
```

```

# Example: OUT_DWG_DIR = C:\ARRIS_users\Owner\DWGs
# OUT_CONFIGFILE: Name for the Export-Config file to display at
# start-up
# Default is corp_std.ocf if existing else SYS STD CONFIG
# Example: OUT_CONFIGFILE = lnwt2pen.ocf
# IN_CONFIGFILE: Name of the Import-Config file displayed at start-up
# Default is corp_std.icf if existing else SYS STD CONFIG
# Example: IN_CONFIGFILE = lnwt2pen.icf
# LOGFILEMODE: the Log Mode you want to display at start-up
# LOGFILEMODE = YES
# ACADRESOURCE: The full path to the folder where the files 'acad.pat'
# and 'acadiso.pat' exist; these two files are needed if you are
# mapping ARRIS RI-Patterns to Acad Patterns
# Example1: ACADRESOURCE=C:\ARRIS_STD\trans.dir\acad_support
# Example2: ACADRESOURCE=C:\Program Files\ACAD2000\SUPPORT

```

The end user should edit this file to her/his preference, as shown above in the example associated with each setting.

Two new Options for the DWG Import that make it possible to support large DWG files that produces a display list more that ARRISCAD and BuildersCAD can handle.

[Subject requested by Robert Trinidad]

Some Contours-Lines (COGO) DWG files comes with a layer having a large number of 2D Polylines or LWPolylines with dashed lines. This combination creates a display list that cannot be handles with the current ARRIS display list routine. During loading this layer in ARRIS - or if these Polylines comes within a Block during freezing this Repeated Item - and while creating the display list an error message occurs as follows:

“Page Management ERROR – Error Trace back: in \$wlycre()”. Or “Cannot allocate any more pages for this task: 0x173. Already at maximum: 32765 - Error Trace back: in \$wlycre().”

These two options are designed to overcome this difficulty and give a workaround to solve this problem and create an ARRIS Layer that can be displayed in ARRISCAD and BuildersCAD. You can use either one of them or both together It is recommended not to use any of these two routines unless you are sure that your DWG contains a large number of 2D Polylines drawn with LineType other than Continuous that when loaded in ARRISCAD – or when freezing an RI that has these Polylines - causes any of the above error messages.

See Chapter 10 for more information.

H- The ARRIS Dash Lines display properly in the AutoCAD ViewPort.

AutoCAD paper spaces (layouts) have each a separate linetype scale different than the model space. Translator now sets the PSLTSCALE for each layout to correspond to the ARRIS settings.

