



Repeated Items

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This seminar will cover the basics of Repeated Items:

- How to create Repeated Items
- How to manipulate Repeated Items using the RI Library Manager.
- How to create and maintain Repeated Item Catalogs using the RI Catalog Manager.
- How to Create and use Multi-Layer Repeated Items.

For the purposes of this seminar, the **ARRIS** menus will be used, and **ARRIS** documentation is referenced. The topics covered are identical in BuildersCAD. For BuildersCAD users, the referenced Encyclopedia documentation may be found in the BuildersCAD Encyclopedia under the same topic names.

Creating A Repeated Item

The first step in creating a Repeated Item is to draw the item. This should be done on a single layer (Multi-Layer Ris are discussed separately below).

To actually make the RI, select the Make RI button under the Create heading on the Repeated Item application sub-menu. **ARRIS** will prompt for the first and second point of a window or "fence" around the item. Box in everything that is to be included in the RI. **ARRIS** will next prompt for the Repeated Item Origin. This is the single point to which the whole RI will be referenced and will be the 1 point placed in the database when the RI is placed. **ARRIS** will then prompt for the RI name, then the RI Library. The new Repeated Item will have the given name and be stored in the named RI Library.

Notes:

- The origin point may be any point. It is usually a recognizable point within the RI such as a line endpoint or midpoint. This would be selected with an F3 or F11 when the RI is made. The origin can be any point however, even a point outside the RI.
- The RI name may be up to 64 characters. Note that this doesn't mean you should make RI names a novel. RI names are better kept short. The entire RI name displays in the RI Select menu so long names may reduce in size to fit into the menu box to the point of becoming unreadable.



- The RI may also be created using the mnemonic :rim. This works the same as the menu button except that the prompts are in a different order - Name, Fence, Origin, Library.
- If the Repeated Item Library name does not exist, the library will be created in the current working directory (or full path if given) with the new RI in it.
- If the Repeated Item name exists in the library given, the old RI in the library will be overwritten with the new one you are creating.

Repeated Item "tricks"

- Repeated Items are unique in that they contain other **ARRIS** entities. This presents some interesting possibilities regarding RI Properties.

If an entity flag (property) of an entity within a Repeated Item has no value - meaning it has a value of #fnone at the time the entity was drawn, that entity will take on the value of the same parameter of the Repeated Item entity. Example: If a line is drawn with a color value of #fnone, it will appear white on the screen and have no value. When the line is included in a Repeated Item, and the RI is placed, the line will take on the color value that is current at the time the Repeated Item is placed. This is something that is commonly done with the Pen and Color parameters in **ARRIS** repeated items and there are many examples in the standard **ARRIS** libraries. This allows the user's pen and color standards to be used. This same technique may be used for other properties - such as line type, allowing the same RI to be placed using solid or dashed lines.

To set a pen value to None, at the keyboard type ":pen", then at the prompt type "#fnone" and Enter.

To set a color value to None, at the keyboard type ":col", then at the prompt type "#fnone" and Enter.

To set a the line type to None, at the keyboard type "\$setvar(#flin,#fnone)" and Enter.

- Repeated Item names must be unique within the library in which they are stored. One old trick in having 2 versions of something is to create the 2 different items with the same name and store them in different RI Libraries. **ARRIS** displays Repeated Items based on the library loaded. You could place the first version of the item from



the first library and have it look one way, then load the second library, recreate the display list, and then **ARRIS** will display the second version. It's the same RI - you have just changed the look by loading a different library.

- Repeated Items may be created so that they "mask" over other entities which are on lower number layers or are placed before the RI on the same layer. This is done by placing a pen 0, color 0 Solid Fill Crosshatch which covers the extents of the RI or the portion you want masked. The rest of the RI is then drawn "over" the mask. There are several examples of this in the standard **ARRIS** RI library - such as fixtures which when placed will cover floor patterns, etc.

Repeated Item Do's And Don'ts

While technically any **ARRIS** entity may be included within a Repeated Item, there are a few that don't work as well.

- Don't include Paint entities in Ris.
- Be careful about using Patterns (Crosshatch) inside Repeated Items. Keep it simple.
- Be careful about using Text inside RI's. This can be done but it makes the text uneditable unless you freeze the RI.
- Be careful about using Walls inside RI's. Many people do this to make unit plans that are then placed in multiples to create an overall floor plan. If walls are used in Ris, center justification works best.

Repeated items are intended to be smaller collections of entities that are placed in multiples, not large amounts of drawing.

Repeated Items may be nested - meaning you can include a Repeated Item inside another Repeated Item. This is sometimes done to create "assemblies" of things. Be very careful if you do this, particularly with RI naming. Each RI name must be unique.

Remember that Repeated Items may be 3D! A collection of **ARRIS** surface entities make a great RI. One of the secrets to fast 3D modeling is to make anything repetitive an RI. You can quickly populate your model with a lot of detail things that dress it up - such as furniture, etc. See the zebra3d.ri library and catalog in **ARRIS**.



Repeated Item Libraries & Catalogs

It is very important to understand the difference between a Repeated Item Library and a Repeated Item Catalog. Repeated Items are selected for placement from the RI Select Menu which can display the Repeated Items either directly from the Library, or from a Catalog.

Repeated Item Library

The RI Library is a file on your computer where the actual repeated items are stored.

- Repeated Items are stored in the library alphabetically by name.
- Currently there is no description available with the RI in a Library.

When the Repeated Item itself is actually created, it is stored in a library. Libraries should be located either in the Standards directory or Project directory, depending on how they are to be used. System and Plug-In RI Libraries are found in the *Vib* directory of your **ARRIS** / BuildersCAD installation and in the application directory of the plug-in respectively. The RI Library name has a .ri extension. The Repeated Item Select Menu will search these locations automatically and list all Repeated Item Libraries found for selection.

The RI Library Manager allows you to create libraries, and manipulate RIs within the library including adding RIs to a library, extracting RIs from the library, deleting RIs from the library, and renaming RIs within the library.

The **RI Library Manager** topic of the **ARRIS Encyclopedia** is included on the conference CD for reference.

Repeated Item Catalog

The RI Catalog is a simple text file list of repeated items organized into Categories and Headings. It is NOT where the Repeated Item itself is stored, but is merely a list referencing the RI name, Description, and Library which allows you to select the desired repeated item very quickly from a large collection.

- Repeated Items are stored and listed in the catalog within user defined Categories and Headings, in any order as defined by the user.
- A user defined description is stored in the catalog with the Repeated Item.
- Headings are a subset of a Category. Repeated Items are listed within a Heading.
- A Repeated Item may be listed more than once in a catalog.
- Repeated Items from more than one library may be listed in a Catalog.



It is important to note that the RI Library and RI Catalog are two distinct and separate things that are not linked in any way. If a Repeated Item is deleted or renamed in a Library, the listing of that RI in a catalog is not changed in any way. The RI would need to be deleted from the catalog or renamed. When a Repeated Item is created, it is stored in a Library. It is *not* automatically added to a catalog. The RI must be added to a catalog as a separate process from its creation. The Catalog is used only in the placement process to reference to an actual Library and RI.

User created RI Catalogs are stored either in the Standards directory or in the Project directory, depending on how they are to be used. In both cases, the catalog is found in a subdirectory named ricat.dir. System and Plug-In RI Catalogs are found in the lib directory of your **ARRIS** / BuildersCAD installation and in the application directory of the plug-in respectively. The RI Catalog file itself is an ascii text file and has a .ct extension. The Repeated Item Select Menu will search these locations automatically and list all Repeated Item Catalogs found for selection.

The **RI Catalog Manager** topic of the **ARRIS Encyclopedia** is included on the conference CD for reference.

Multi-Layer Repeated Items

The Multi-Layer Repeated Item is now supported with **ARRIS** / BuildersCAD **9.0**.

Multi-Layer Repeated Items are just like standard repeated items except they contain special flags on the geometry within the RI to display portions of the Repeated Item across more than 1 layer. Multi-Layer RIs are stored in a library, and may be placed from a library or catalog from the Repeated Item Select menu, just like any other RI. A Multi-Layer RI may be placed on any layer.

- A Multi-Layer Repeated Item is still a single entity which is placed on a single layer. When a Multi-Layer RI is created, the layer name where each entity included within the RI is drawn is stored within the RI.
- Entities in Multi-Layer RIs (and other Multi-Layer functions) will operate with a set of flags that comprise a 64 character layer name. This is the maximum length for a layer name.
- Extrema will not check for layer modes. An Unzoom command will zoom to the entire Repeated Item, even if some layers to display a portion of the RI are turned off.



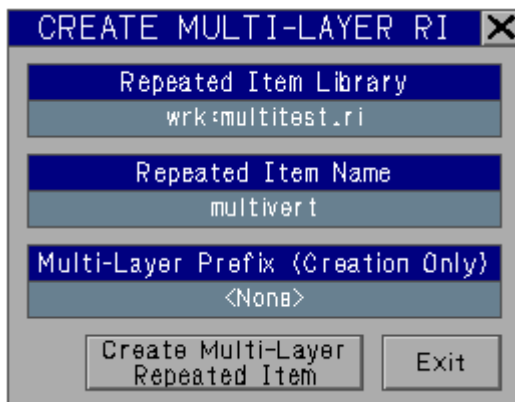
- Edits are performed in the placement layer only. If you delete the RI, or move the RI, the entire RI is deleted or moved, including parts which display in layers that are turned off and are thus not currently visible.
- Searches will check the display layers. If you are searching for the display list of a point such as the endpoint of a line within the RI, the point or line must be in a layer that is currently visible.
- Multi-Layer Repeated Items may be nested, similar to normal Repeated Items.
- Multi-Layer Repeated Items may be translated.

There are two basic types of Multi-Layer Repeated Items – Fixed Layer and Variable Layer. With Fixed Layer Multi-Layer RIs, the display layer names for the entities within the RI are fixed to specific layer names. The entities will only display when the specific layer name is present and turned on. Relative Layer Multi-Layer RIs store a portion of the layer name at the time the RI is created and append it to a portion of the placement layer name to determine the display layer name for specific entities within the RI.

Creating A Multi-Layer Repeated Item

Creating a Multi-Layer Repeated Item is similar to creating a standard RI. You must first draw the item. In the case of the Multi-Layer RI, the geometry to be included in the RI may be drawn across multiple layers. Geometry which is drawn in layer "0" (name, not number) will be included in the RI as non-Multi-Layer data.

To create the Multi-Layer Repeated Item, select the Multi-Layer button under the Create heading on the Repeated Item Application Sub-Menu. This brings up the Create Multi-Layer RI pop-up menu. The parameter settings and commands on this menu are as follows:





Repeated Item Library: This command allows you to set the Repeated Item Library in which the new Multi-Layer RI will be stored.

Repeated Item Name: This command allows you to set the Repeated Item Name for the new Multi-Layer RI>

Multi-Layer Prefix (Creation Only): This parameter is a layer group "prefix" which is used for creating Multi-Layer Repeated Items that will be placed in a variable layer set. The prefix is the first (common) portion of the layer name for layers where the geometry to be included in the RI is drawn. As the RI is created, this portion of the RI name is dropped and only the remainder (unique) portion of the display layer name is retained. When the RI is placed, the remaining portion of the layer name is appended to the placement layer "group" portion of the layer name. This enables the RI to be placed in various groups of layers and still have the portions of the RI display on the correct specific layer for the placement group.

Create Multi-Layer Repeated Item: This command creates the Multi-Layer RI. The actual creation is similar to creating a normal RI using the RI Create command. The Create Multi-Layer RI menu will clear from the screen. **ARRIS / BuildersCAD** will first prompt for the first and second point of a window (fence) which defines the extent of your Repeated Item. Select points that will completely enclose the entities you wish to include in your Repeated Item. All entities on all layers that are completely within the fence will be a part of the new RI. **ARRIS / BuildersCAD** will then prompt for the Repeated Item *Origin* point. This is the point by which the RI will be placed and selected in the database. This is usually an existing point on an entity within the RI selected using the F3 key. The origin point may be any point however, within or outside the collection of entities comprising the Repeated Item, and may be selected based on a logical location for when the RI is placed. The name of the Repeated Item created and the RI Library into which it is placed are as they are set on the Create Multi-Layer RI menu.

Exit: This command clears the Create Multi-Layer RI menu from the screen. The Multi-Layer RI is not created.

Placing A Multi-Layer Repeated Item

A Multi-Layer Repeated Item is placed using any of the placement commands or menus, just like any other Repeated Item. The RI may be placed on any layer, either a display layer for entities contained in the RI, or any other layer.



- The layer where the RI is placed must be On for display or none of the RI will display, even if other layers named on the flags for entities in the RI are on. Because of this, Multi-Layer RIs should be placed on a master layer (such as "xxx_ribase") which can remain on, giving display control to the other layers carried on the flags within the RI. Alternately the RI should be placed on a layer which is always on if the Multi-Layer features are desired.

Example: The RI could be placed on a "furniture" layer, and use multi-layers for labels such as part number and description. The "labels" may be turned off separately from the main "furniture" layer but the labels cannot be turned on unless the main "furniture" layer is on.

- Once placed, the entities within the RI will display according to the layer modes named on the flag in the entity (the layer the entity was on when the RI was created).

Example: Say you have lines drawn on layer "one", "two", and "three", and create a Multi-Layer RI containing these lines. If the RI is placed on layer "base", then layer "base" must be on for display or none of the RI will display. Assuming layer "base" is on, the lines originally drawn in layer "one" when the RI was created will display if layer "one" is on for display, the lines originally in layer "two" will display if layer "two" is on for display, and so on. If the layer is off, the portion of the Multi-Layer RI for that layer will not display.

- Layer "0" (layer name "0", not layer number 0) is ignored for Multi-Layer definitions. Geometry which is on layer "0" at the time the Multi-Layer RI is created is treated as non-Multi-Layer geometry. This geometry will display with the layer in which the RI is placed, similar to a normal RI.
- If the display layer for a portion of the Multi-Layer Repeated Item does not exist in the currently loaded drawing, that portion of the RI will not display. The layer is not automatically loaded if it exists, or automatically create if it does not exist.
- For "order of display", the Multi-Layer RI will be displayed when its occurrence is found on the layer where the RI is actually placed. All portions of the RI are displayed at this time, regardless of the order of the display layers contained on entities within the RI.

Variable Layer Names

When a Multi-Layer Repeated Item is created, a prefix may be designated which indicates a portion of the layer name for entities within the RI that is dropped during creation of the RI. When the RI is placed, a special layer name ending in "ribase" is used for the placement



layer that allows the portion of the placement layer name before "ribase" to be substituted for the prefix that was dropped during RI creation. This feature allows placement of Multi-Layer Repeated Items in different layer "groups" such as first floor, second floor, etc. using the same Repeated Item. In order to use this feature you *must* have a well designed layer standard and naming convention.

- The layer where the RI is placed must be named using a layer "group" designation plus "ribase".

Example: Create a Multi-Layer Repeated Item which will display using 5 layers which are in a variable group. Assume you have the layers "p01wall", "p01fixt", "p01poch", "p01keys", and "p01note". Draw the various parts of the RI in the various layers – walls in layer "p01wall", fixtures in layer "p01fixt", poche in layer "p01poch", and so on. When the Multi-Layer Repeated Item is created, designate the *Multi-Layer Prefix* as "p01". When the RI is placed on a layer "p01ribase" and this layer is on for display, the walls will display with layer "p01wall", the fixtures will display with layer "p01fixt", the poche with layer "p01poch" and so on. When the RI is placed on a layer "p02ribase" and this layer is on for display, the walls will display with layer "p02wall", the fixtures with layer "p02fixt", the poche with layer "p02poch" and so on. The portion of the base layer name before "ribase" (such as "p02") is substituted for the prefix designated when the RI was created ("p01" in our example) in the original display layer name.

- Layer names are used for variable layer names in Multi-Layer Repeated Items instead of layer numbers (+1, +2, etc.) because layer numbers in **ARRIS** are not necessarily consistent across drawings. The same layer may have 2 different numbers in 2 different drawings. Also this method had been used, if a layer were to be deleted within the range of numbers used, then the display of portions of the Multi-Layer RI would shift to the wrong layer.

Refer to the Repeated Items topic in the **ARRIS** or BuildersCAD Encyclopedia for more information on Repeated Items.