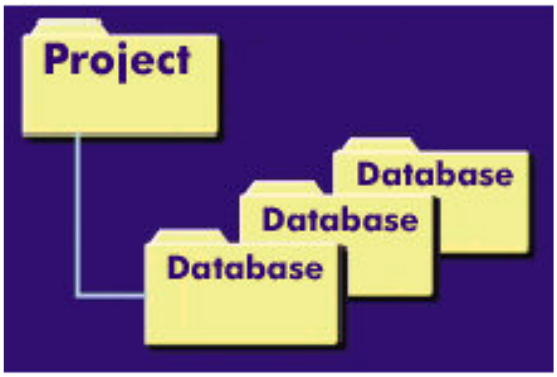
Viewports and Sheets In ARRIS

It is difficult to explain the concept of *viewports* without first understanding the concept of *sheets*. Sheets, in turn, are difficult to define without understanding the concept of *drawings* which includes the concept of *layers* and *databases* and finally entire *projects*.

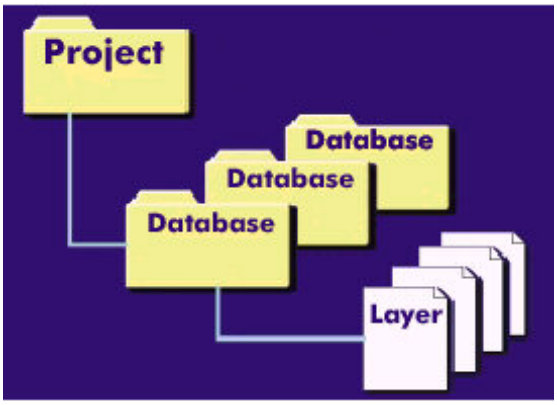
With that in mind, the following is a quick overview of the ARRIS *Project Universe* so that the relationship between the various drawing components mentioned above will make more sense.

The ARRIS Project



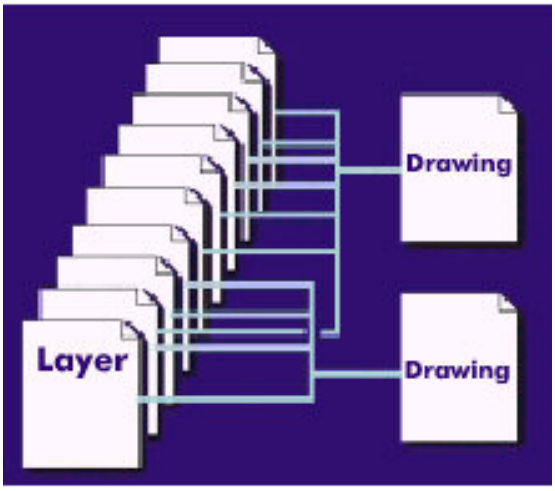
If you were using MS Explorer to view an ARRIS *project*, it would look like this. A *project* (.pj) is simply a directory that stores all of the *databases* which belong to one specific project.

The ARRIS Database



An ARRIS *database* (.db) may be best described as a *project* sub-directory used to store the *layers* for all, or just portions of, a project. A database actually stores more than just layer files. It also stores *drawings* and can even store *sheets*.

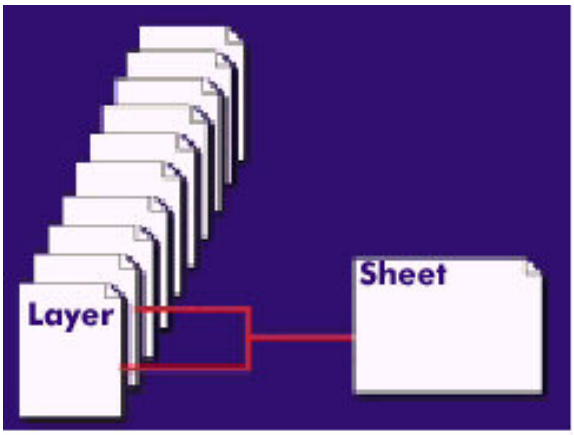
The ARRIS Drawing



An ARRIS *drawing* (.dr) is nothing more than a collection of layers. The layers contained within a drawing are typically grouped together for the purpose of creating a single page (notice I said *page* and not *sheet* so your head wouldn't explode yet) in a plotted set of plans.

If a *drawing* file is viewed from Windows Explorer, it appears as a simple text file containing a list of all the layer names (and numbers) that belong to that drawing.

The ARRIS Sheet



One of the simplest ways to describe an ARRIS *sheet* (.sht) is to say that it is a special two-layer drawing. However, sheets differ from drawings in several ways. Here's a brief summary of their likes and differences:

Similarities Between Sheets & Viewports

- Both contain a list of layers
- Both are stored as text files (or registries) in a database

Differences Between Sheets & Viewports

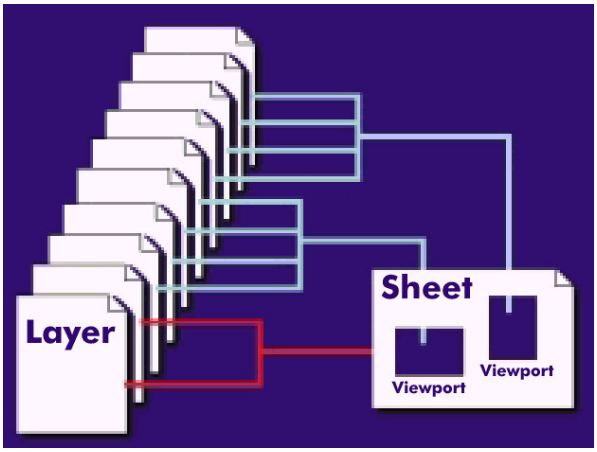
Drawings	Sheets
Contain only *model space* layers	Contain only *paper space* layers
May contain any number of layers	Contain only two layers (excluding viewport layers)
May be viewed in 2D or 3D	May only be viewed in 2D (plan view)
Graphics may be drawn at any scale	Graphics limited to 1:1 (full) scale

The two layers that comprise a sheet have a very specific purpose and numbering convention. These two layers are created automatically with each new sheet. Below is a description of their specific functions:

1. The *first* sheet layer is always numbered as *–100* and contains the *sheet-independent* title block information that is shared by all the sheets in that database or project.

2. The *second* sheet layer is always numbered as *–10* and contains the *sheet-specific* title block information (i.e. sheet name, sheet number, date, revisions, etc.) as well as any viewports entities that will be placed on this sheet.

The ARRIS Viewport



At last we finally get to the ARRIS viewport, the essence of this discussion. Getting a mental grasp of viewports is a little tricky at first, but once you've worked with them for a short time you begin to realize how simple and user-friendly they really are.

Think of a *viewport* as a 2D rectangular window that can be placed on a sheet. Through this window you can view any model space layers from any database in your project directory at any scale you choose.

Furthermore, several viewports can be placed on the same sheet and view completely different sets of layers in a drawing set. Different viewports can even display the same layers but at different scales. Changes made to layers contained in one viewport are automatically updated in other viewports that share that layer(s).

The introduction of sheets and viewports in ARRIS 7, and the enhancements made to improve their capabilities in ARRIS 8.2, allow the user an opportunity to totally rethink the database, drawing, layer structure and methodology they have used for producing construction documents in previous releases. The more you use them, the more you will wonder why you haven't gotten around to using them more in the past.

The following is a list several important benefits offered by sheets and viewports:

- **A database navigation tool** – Viewports not only display model space layer information at various scales and view clips, they can be used as *portals* to access the layers stored within, just as if you opened them in a drawing. With viewports, there's no need to remember the names of the drawings or layers associated with various drawing components. Move from viewport to viewport on a sheet and you have instant access to all layers referenced in any viewport.
- **A drawing composition and visualization tool** – Place and arrange details from any combination of layers at any scale to create complex detail sheets and virtually unlimited plotting vignettes.
- **Reduce error checking** – Changes made to any viewport layer will automatically be updated in all shared viewport layers. Reduces the need to scrutinize multiple drawings for changes because copies were made at different scales.
- **Assign multiple pen maps** – Use viewports to grayscale lines on certain layers and assign a different color and line width to the same layers on another plan.
- **Matchline referencing** – If your project is of a size that requires different portions of a single plan to be placed on multiple sheets with matchline references from one sheet to another, you can use viewports to accomplish this while maintaining a single, unbroken master floor plan.

Model Layers & *Sheet* Layers

In ARRIS, every layer is maintained as a separate file within the database. Every layer can also be classified as either a *model* layer or a *sheet* layer. This is an important distinction when discussing the concept of layers and viewports.

> *Model* Layers – In previous releases of ARRIS, all layer were considered to be *model* layers. Although the term was not used, *model* mode was the traditional method for working in ARRIS – completely three-dimensional, in any view and at any scale. Viewports always contain a collection of one or more *model* layers.
>
> *Sheet* Layers – *Sheet*layers are used for assembling plot information on a flat (2D) sheet. Sheet layers can be recognized in a drawing by their negative numbers and by the *underscore* prefix to their layer name. Sheet layers are the only type of layer onto which you can place a viewport.
>
> By definition, you are working in 2D when you work on a sheet layer. Therefore, 3D views such as isometric or perspective are not available. The required scale for sheet layers is 1:1 (full scale).

Using Viewports and Sheets

Since viewports are *sheet dependent* (i.e. you can't place a viewport until you've created a *sheet* to place it on), here's a step-by-step exercise taken from the *ARRIS 7 New*

Feature Reference Guide which will assist you in the process of creating your first sheet and placing viewports:

Exercise – Creating A Default Sheet Template and New Sheet

The first step in the process is to create a *default sheet template* that will be used as *template* for all sheets within a single project or even multiple projects of the same type.

Since sheets are stored in a database, the first step is open a database which you will want to use to store your sheets for a project. In this example, let's assume you have created and opened a new database named **lesson1** that contains a copy of a typical office database that can be used for creating and placing viewports.

Now follow these steps:

Creating A Default Sheet Template

On the PROJECTS menu, select the NEW icon (This brings up the NEW Options popup menu).

Click on SHEET on the NEW popup menu. (This brings up the SHEET CREATE popup menu).

Click on the *Template Create Menu* button at the bottom.

Double-click on the BLANK SHEET thumbnail. You will see the prompt:

Designation for new template (max. 6 chars)?

Select DEFAULT (_sht.sht) from the options menu.

You will see a message saying SAVE COMPLETED at the prompt line.

(Notice that in the Project Information Area on the Main Menu, your current project name is displayed as /lesson1.db/_sht.sht. The designation "_sht.sht" indicates a default sheet template. All graphics that you draw on this sheet template can be used when creating other sheets. Below the project name the word SHEET is displayed on a red background. This indicates that the layer you are working on is a sheet layer. In the area to the right of the mode indicator, the sheet scale is displayed as 1:1 (feet).)

Left-click on the LAYER menu to bring up the LAYER MODES popup.

(On the LAYER MODES menu, you will see that you have two new layers. The first layer is a sheet layer numbered -100 and named " _brd.ly". The second layer is also a sheet layer numbered -10 and named "_sht.ly". Sheet layers are indicated on the LAYER MODES popup by negative layer numbers, an underscore "_" at the beginning of their names, and the red color of the boxes on this menu. The layer named " _brd.ly" is the border layer on which you should draw those items that will be common to all of the sheets in your project. Examples of common items would be the sheet border, your title block, project and client names. The other layer named " _sht.ly" is the sheet layer on which you should place those items that may change from one sheet to the next. Examples of these items would be the sheet number, the sheet title, the sheet scale, and revision history.

Creating A New Sheet From The Sheet Template

On the PROJECTS menu, select the NEW icon (This brings up the NEW Options popup menu).

Click on SHEET on the NEW popup menu. (This brings up the SHEET CREATE popup menu).

Double-click on the *_sht.sht* thumbnail. You will see the prompt:

New sheet name?

Enter **a1** to name the sheet. Then you will see the prompt:

Sheet title?

Enter **Floor Plan** for the sheet title.

(You will see a copy of your default sheet template. Layer -100, named "_brd.ly", is the same layer you created for your default template, but it is included on this sheet in read-only mode. Layer -10, named "_a1.ly", is a copy of layer "_sht" on your default sheet template. Because you are working on a copy, any changes you make to this layer will affect this sheet only. If your template included Title Block information, change the text now to fit your project information, revision number, etc.

Do not forget to save the sheet when you finish making it. Repeat this process to create and save sheet a2 — the fixture plan and sheet a3 — the ceiling plan.

Now that you've created several new sheets (a1-a3) from your original *default* sheet template, the next step is to place *cut* and *place* your first viewport onto one of your newly created sheets. Before continuing, however, here's a quick overview of the two phases of a viewport:

2 Phases of a Viewport

Unassigned Viewports:
The first phase of a viewport involves defining or *cutting* a viewport from an existing drawing. Before a viewport is placed on a sheet, it only exists as a viewport definition file. This file is located in the database subdirectory named *vports.dir* and the filename corresponds to the viewport name with a *.vp* extension. Remember, *viewports are always stored under the database from which they were cut!*

Assigned Viewports:
The second phase of a viewport is *placing* the viewport. A viewport can only be placed on a sheet. Once placed, it is no longer associated with the original viewport parameters from the viewport file. That is, changes made to a viewport that has been placed (such as scale, rotation, size, etc.) do not affect the original viewport definition (.vp) file.

Defining & Assigning Viewports

Viewports can be defined (cut) in a *drawing* or defined (created) on a *sheet*.

CUTTING A VIEWPORT: defines a *viewport definition file* (.vp), which contains information describing its size, view, and layers. This information is used later in placing (assigning) the *viewport* on a *sheet*.

1. Open a *drawing* with graphical data already drawn.
2. Select the *viewport* button (VP icon) on the **MAIN** menu to invoke the **CUT VIEWPORT** pull-down menu. Select the `[NAME]` button to specify the *viewport name* (required). Next, specify a *scale factor* (optional) and *cut method*, and select `[OK]`.
3. Fence in the desired area on the current *drawing* and answer `[yes]` to the verification prompt.

Note 1: See `[CUT NEW VIEWPORT]` routine on the **MODIFY VIEWPORT** menu for cutting a *viewport* within a *viewport*.

Assigning A Viewport: adds a viewport to the current sheet from the specified viewport definition file.

1. Open a sheet
2. Select the *viewport* menu (VP icon) on the Main menu to invoke the VIEWPORT LAYOUT menu pull-down menu. Select the PLACE FILE specify the name of the *unassigned* viewport (.vp) file.
3. Specify a location on the sheet.

Viewport Menus

There are 4 context sensitive **VIEWPORT** pull-down menus, depending on what is currently active; *drawing*, *sheet*, or *viewport*. All 4 **VIEWPORT** pull-down menus are invoked by selecting the *viewport* button (VP icon) on the **MAIN** menu.

Table 0:1 Viewport Menus

VIEWPORT MENU	CURRENTLY ACTIVE	ENVIRONMENTAL MODE
VIEWPORT CUT	drawing	Model Space
VIEWPORT LAYOUT	sheet	Sheet Space
MODIFY VIEWPORT [1]	viewport (on sheet)	Model Space
MODIFY VIEWPORT [2]	viewport (full screen)	Model Space

Note 1: Some plotters will not support opaque mode.

Note 2: Existing *viewports' opacity* can be changed to the current settings with the [REMAKE] option.

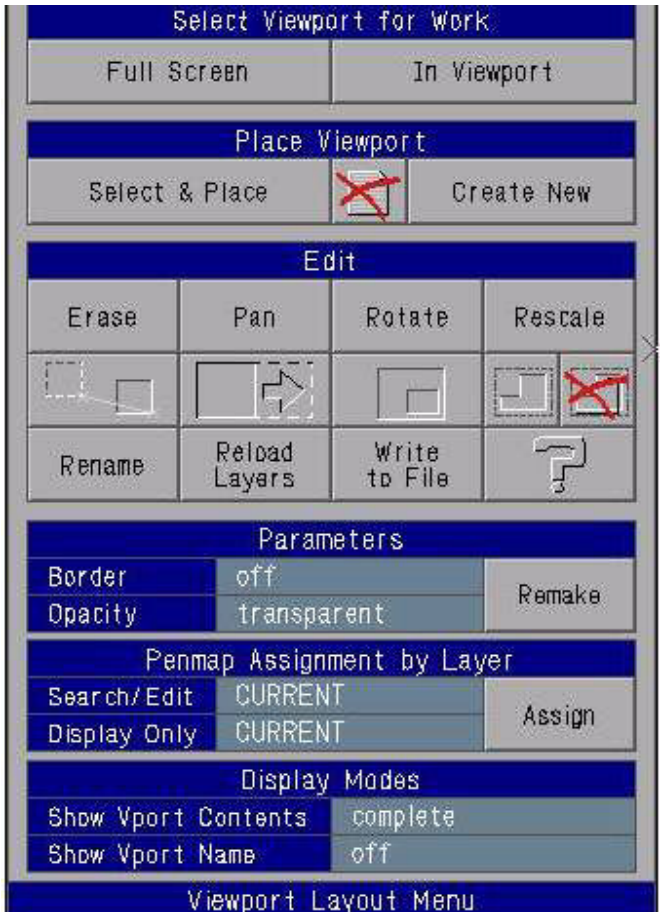
For a detailed breakdown and description of the each viewport menu listed above, see *viewport* in the ARRIS Encyclopedia documentation.

The Different Viewport Menus

The following menus represent the three different *Viewport* menus that will be presented depending on whether the current ARRIS environment mode is a *sheet space,* a *model space* or a *viewport.*

Viewport Layout Menu

Environmental Mode: currently opened file is a *sheet*
Focus: tools for adding, erasing and modifying the display, rotation, size, scale and location of viewports on a sheet.



Viewport Cut Menu

Environmental Mode: currently opened file is a *drawing*
Focus: tool for creating (cutting) a new viewport by selecting its name, scale and size.

Viewport Modification Menu

Environmental Mode: currently opened file is a *viewport*
Focus: tool for modifying current viewport parameters such as size, view orientation, number of layers, layer modes and masking.

Advanced Viewport Techniques

- Creating Exterior Elevations Using Workplane And Rotated View Orientation
- Aligning Two or More Viewports
- Assigning Multiple Penmaps to Viewports
- Creating Sheet Templates (styles.dir/sheet.lib)
- Using Sheet Info Tools
- Using *In Viewport* Mode

Viewport Tips

Aligning Viewports

Imagine a scenario where you wanted to align the finish floor line of several exterior elevations that were placed in different viewports along a horizontal line.

1. Using a pen 0 line type, initiate the *single line* command. When prompted for *"First point of line:"* respond by going to the *Find* menu (to the right of the Copy menu), and selecting the *Snap To Point In Viewport* icon that looks like this:

   and snap to the endpoint of a finish floor line in the first viewport which needs to be aligned.

   When prompted for *"Endpoint of line:"*, enter a point of any length along the horizontal X-axis to form a short *grip* line.

2. Repeat as needed for the remaining viewports.

3. Use double reference point to align the viewport *grip* lines (which extend out from each viewport) to a common registration point on the sheet or align them to one another.

Adding New Layers to Sheets

There is an undocumented mnemonic command named *lyad_sht* that will allow you to add additional layers to a sheet. This is useful for placing things like revision bubbles that can be turned on and off independently of the two default viewport layers.

The new layer numbers must fall into a range between *–10 and –100.* You may wish to use an abbreviated combination of the *sheet name* and *layer content* as part of the new layer name so that it remains unique in the event that new layers are added to the same sheet or other sheets (example: *revs_a2.ly*).

Assigning Multiple Penmaps to Viewports

This feature can be useful for assigning a grayscale or halftone penmap to layers background layers in a viewport to contrast with the featured layers displayed in the current penmap for sheets such as electrical plans, reflected ceiling plans, etc.

1. Create a new penmap and set the RGB value of each pen to some grayscale value such as 50% or 30% gray.

2. Select a viewport for *work* and set all the layers that need to be represented as background layers, such as the layer(s) containing the walls, to *display only*.

3. Now select *Apply Layer Modes* from the VP (viewport) menu

4. Save the database and return (exit) to the *sheet*.

5. Select the VP (viewport) menu. Below the *Penmap Assignment By Layer* label, select the box labeled *Current* opposite the row labeled *Display Only*.

6. Browse to the location of your new grayscale penmap and select it from the menu.

7. Now select the *Assign* button to the right and select the viewport(s) to which you would like to assign the grayscale penmap to layers set to Display only.

8. Save the sheet and plot.

Updating Sheets After Changing The Sheet Master

If you need to make changes to your prototypical *master sheet* (_sht.) drawing after new sheets have already been created for your project you will need to update the existing sheets with the changes.

To do this, open a sheet that needs to be updated then make the following menu selections in ARRIS:

FILE DRAWER → Sheet Info → Load Fields

Updating Viewport Layer List On Sheets

Sometimes when you export ARRIS sheets to Autocad it translates more layers than are being displayed in your viewports.

The occurs because the sheet keeps track of all the layers that have been *loaded* (added) into the various viewports, even if they were subsequently *removed*. These layers will often be translated along with the sheet unless you open the sheet and select the following Viewport menu options:

VP → Reload Layers

Answer *Yes* to the prompt: *Also remove any unreferenced model layers?* Then save your sheet and export it again.