

**AN 161**  
**ArrayProcessing on tour**  
**1.3 en**

## 1. Background

Touring applications with ArrayProcessing pose a number of specific demands on ArrayCalc and R1 and the interaction of these tools:

- How to derive meaningful ArrayProcessing settings for your show.
- For the sake of consistency and efficiency, touring system engineers prefer to work off of a single project file if possible instead of having to “start from scratch” every day.
- The venue configuration and possibly the system configuration in terms of box count or type changes daily.
- ArrayProcessing parameters change several times per day depending on the atmospheric conditions.
- Often, some modifications of the R1 project are necessary to create additional controls or indicators that an operator would like to have and it would be beneficial if those would not have to be done from scratch every day even if the system configuration changes somewhat.

With the introduction of ArrayProcessing and in particular with the transition to a unified file format in ArrayCalc v10 and R1v3, a number of validations were introduced.

On the one hand it must be avoided that ArrayProcessing settings that do not match the physical array configuration are accidentally applied to an array. On the other hand, since both ArrayCalc and R1 are using the same project file instead of two different file types to enable Soundscape, certain manipulations which used to be possible in R1 are now no longer allowed, such as changing the loudspeaker types of sources generated in ArrayCalc.

All of this may lead to difficulties or confusion and this is why we would like to delineate a few useful best practices for different scenarios in this document.

## 2. ArrayProcessing setup workflow

ArrayProcessing is sometimes misunderstood in that many people perceive its main purpose to be to make the spl as equal as possible everywhere. Actually, ArrayProcessing was introduced for arrays to produce the same tonality everywhere while giving the option to manipulate the level distribution throughout the depth of the coverage within reasonable limits.

As creating a constant tonal balance over distance is the main purpose and a non-adjustable feature of ArrayProcessing, it is the responsibility of the system engineer to find an appropriate level distribution that matches the event and the venue. We have found that the following procedure makes this process easy and understandable:

1. Recreate the intrinsic level distribution of the array as a first step. This only resolves variances in tonality without changing the level. Note that before the advent of ArrayProcessing, the resulting (unchanged) level distribution would have been perfectly acceptable.
2. Play back a reference song or multitrack of the show, setting the expected show level at front of house.

3. While the system is playing at show level, walk to the rear of the intended coverage area while taking mental notes about how much the perceived level changes and whether this change is appropriate for the kind of show, the venue and the expected audience.
4. Do the same while walking to the front. Indoors, pay additional attention to the audibility of reflections from the rear of the venue.
5. Copy the previously used ArrayProcessing settings into a free slot and make changes based on your observations. Keep in mind that reducing the level difference between front and back will make reflections more obvious when listening from close to the stage. Also, allowing for a certain level drop to the back keeps the image of the music closer to the stage. Repeat from step (2) until the desired result has been achieved.

Often, only relative moderate changes to the intrinsic level distribution result out of this iterative process while achieving a very good acoustic result.

## 3. ArrayCalc & R1 file handling workflow

While it is possible to open the same dbpr project file in both ArrayCalc10 and R1V3 simultaneously, this might not be the best course of action when using ArrayProcessing.

When AP slots are recalculated, it is necessary to save the project file in ArrayCalc in order to be able to transfer the newly generated slots to R1. Should the same file be open in R1 in that moment, the user will be prompted to reopen the project file. This has two consequences:

- The offline-reloading-online cycle in R1 can take a relatively long time, depending on the computer and the system size. During that time, no remote control can be exerted over the system.
- Should the user have made modifications to views or created new remote views without saving the file in R1, those changes will be lost.

In terms of speed it is much preferable to save another version of the dbpr file immediately upon opening it first in R1, e.g. as <myfilename>\_remote.dbpr. This shall be the file that R1 operates with while ArrayCalc modifies and saves the original file.

In this way, both files still stay compatible with regard to ArrayProcessing and the “Import” functionality for AP slots can be used, which is much faster than reopening the whole project file and does not require the R1 instance to go offline.

## 4. Touring with a non-changing setup

The easiest scenario is if your actual PA setup never changes from day to day, which is often true for tours that play very similar venues from day to day, and only need to reangle the PA to conform to the venue of the day.

To be more precise, here is what you can and cannot do in order to have a non-changing setup by the definition of this document:

### What you can do:

- Add new slots to existing arrays.
- Recalculate existing AP Slots with new settings (Power/Glory, level drop characteristics).
- Change Venue Data.
- Change positioning, aiming, and splay angles of the arrays to adapt the system to a different venue.

### What you can't do:

1. Change "basic" array properties:
  - Series type (J, V, Y, GSL).
  - Mounting (Flown, Stacked).
  - Number of cabinets.
  - Loudspeaker Type (e.g. J8 vs. J12).
  - Pair switch.
2. Delete an Array and then create it again, even if it has the same settings.
3. Disable ArrayProcessing on an array without clicking on "Keep current AP settings" in the pop-up dialog.
4. Enable ArrayProcessing on new arrays.
5. Copy/Paste or Export/Import arrays.

In this case, your original "dbpr" project file that you are modified in the allowed ways in ArrayCalc to conform to the venue of the day will always stay compatible with the initially saved copy that you use in R1v3 and where you possibly added controls or made other modifications to one or more remote views. You only need to make sure that you clear the previous day's AP slots from the respective amplifier channels, as well as additional adjustments such as CPL, level, delay and eq that you will at least have to reconfirm if not redo for the new venue.

## 5. Touring with a changing setup

Sometimes, a tour requires the system setup to change, i.e. to perform one or more of the operations listed under "what you can't do" in the previous section. Any of these will break compatibility between the ArrayCalc and the R1 version of a project file when used in the fashion described section 3, potentially requiring a lot of work to be done from scratch, depending on the amount of customizing that has been done to the R1 version of the project file.

The following approaches present different solutions for such applications, the most appropriate of which has to be determined on a case to case basis.

### Approach A: Reoccurring identical setups

Many a times, if enough advance information is available, a relative small number of differing scenarios with regard to the system configuration can be identified, where pairs of dbpr project files for ArrayCalc and R1 can be prepared up front.

For each of these system scenarios:

1. Create a project file (with the data from the first/reference venue of the tour). This project should have ArrayProcessing enabled for all arrays that will be optimized in any of the venues on the tour.

2. If you foresee the need for unpaired arrays at some venues, create these arrays as unpaired, and apply ArrayProcessing to both hangs.
3. Open the project file in R1 and save it immediately as the designated remote control file for this scenario, as described in section 3. Perform the desired modification on this file only.
4. For the next show using this general system configuration, open the ArrayCalc version of the pair of files modify the Venue data, splay angles, array positions, etc.
5. Recalculate the AP Slots.
6. Open your customized R1 version of the project file.
7. Import AP slots for the new venue and send the data to the amplifiers.

### Approach B: Some Venues require shorter hangs than others

If the only difference between system configurations that occurs is that some venues require smaller (i.e. shorter) hangs than others, a useful procedure is the following:

- In ArrayCalc10, create a project that conforms to the largest occurring configuration.
- Open the project file in R1 and save it immediately as the designated remote control file, as described in section 3. Perform the desired modification on this file only.
- On days with shorter hangs, open a copy of the customized remote control version of your project in ArrayCalc. Delete the cabinets you do not require for this venue and save the project file normally.
- Open the project file in R1. It will show some unassigned device controls and possibly some other unassigned controls, depending on your modifications that were associated with individual amplifier channels which are no longer present in the project due to the shorter hangs, but will otherwise be fully functional.

### Approach C: The system configuration changes very significantly from venue to venue

If we disregard the obvious possibility to start completely from scratch in these scenarios, the desire is to keep as much of the customized remote control project file as possible and perform as little repetitive control creation and reassignment as possible.

Here, two basic strategies can be followed.

One is to convert all customized elements into templates. This makes it easy to recreate them but requires visual repositioning on top of complete reassignment of all controls.

The other is to only create custom controls on separate views instead of adding to the default remote views. When the system configuration has been changed in ArrayCalc, R1 requires the recreation of the group tree as well as of all default remote views, the old versions of which have to be deleted. Putting all custom elements onto separate views gives the possibility to selectively delete only the preexisting default views and makes reassignment of controls relatively easy.

