EAR Production Suite (Beta 0.7.1 release)

The latest builds are available under Releases. Please download the files from there. The EAR Production Suite (EPS) download bundle comprises of multiple components:

- EPS VST® Plugins
- EPS REAPER Extension
- ADM Export Source VST® Plugin
- REAPER session template

Release notes

Please note that the EPS currently outputs ADM using egocentric, polar coordinates and conforming to the EBU Broadcast Production Profile. While the EPS can import files that have been authored using the Dolby Atmos ADM profile, coordinates and directspeakers pack formats are converted on import and exported files will no longer conform to this profile.

To fix a problem using the plugins with some hosts, the ID for all plugins changed with the 0.7.0 release. This change will break any projects that use the 0.6.0 plugins. See tools/upgrade_project to upgrade existing REAPER projects.

Version 0.7.1

- Updated JUCE framework to 6.1.5 #171, fixes arm64/macos crash on unhandled keydown events #174
- Disabled interaction panel for non-object types in Scene #173
- Prevent potential out-of-bounds array access on removal of right-most programme in scene #175
- Fix crash when pressing backspace on HOA combobox #172

Version 0.7.0

- Added Binaural Monitoring and HOA Input plugins #156
- Improved default install target locations #4 #79 #95
- Fixed bug that made adding items after moving a programme fail. #5
- Added unique plugin uids and FX category for better DAW compatibility #10
- Added REAPER project upgrade tool #11 #136
- Properly persist parameters when saving/restoring a session #17
- Fixed bug where bypassed parameters were exported to ADM #52
- Improved support for building via Xcode project #53 #66
- Fixed crash on exit in Debug mode #54
- Fixed bug where exported block boundaries were not always contiguous #55
- UI Improvements #56 #114
- Fixed parameter update data race #57
- Export will now set jumpPosition flag where appropriate #62

- Moved some operations off audio thread #64 #68
- Fixed bug where changed parameters might not cause DAW to prompt to save changes #67
- Properly account for tail length when exporting #71
- Fixed bug where changes were not taking place when switching programmes #76
- Fixed bug where 'no name' items could appear in scene #78
- Added support for more speaker layouts in DirectSpeaker plugin #89 #90 #109 #112 #127
- Fixed crash when using ADM extension with a REAPER language pack #91
- Added 2+7+0 monitoring plugin #108
- Removed redundant metadata updates #111 #113 #135 #142 #145
- Fixed memory leak when changing speaker layout #116
- Fixed combo box initialisation issues #118
- Version information now show in plugins and extension #120
- Added support for ADM with two character language codes #121
- Fixed crash due to recursive mutex locking #133
- Fixed issue where scene would remove incorrect items #87
- Preliminary arm64 support for Apple Silicon #137 #148
- Use patched BW64 library #149
- Support ITU-R BS.2076-2 structures and time formats #151
- Fix automation points ordering issue on import #153
- Various CI improvements

0.6.0

- Initial release

Installation

The EPS is designed for REAPER 64-bit, on a 64-bit OS (macOS or Windows)

1. Install REAPER from https://www.reaper.fm/download.php
2. Copy / install the **VST plugins** into your common VST folder.
   - Windows: `C:\Program Files\Common Files\VST3`
   - macOS: `~/Library/Audio/Plug-Ins/VST3`
3. Open REAPER and go to Options -> Preferences -> Plug-Ins -> VST and click Rescan
4. Copy / install REAPER ADM **Extension** into the REAPER plugins folder. Ensure you include the ADMPresets subdirectory.
   - Windows: `C:\Users\(username)\AppData\Roaming\REAPER\UserPlugins`
     Note: If you have a previous version of the REAPER Extension installed to `C:\Program Files\REAPER (x64)\Plugins\reaper_adm.dll`, then this should be deleted on installation of the latest version.
   - macOS: `~/Library/Application Support/REAPER/UserPlugins`
5. Restart REAPER

6. You should see a new menu option **File -> Create Project from ADM file** now. If you don't see this option and you are using Windows, it might be necessary to download and install the Visual C++ 2015 redistributable ("vc_redist.x64.exe") from Microsoft.

On macOS Catalina or above you may experience plugin load errors due to the new Gatekeeper feature. You can disable Gatekeeper globally as per this site using this command:

```
sudo spctl --master-disable
```

You can also manually validate the files after install with

```
sudo xattr -rd com.apple.quarantine \
~/Library/Application\ Support/REAPER/UserPlugins/reaper_adm.dylib \
~/Library/Audio/Plug-Ins/VST3/ADM\ Export\ Source.vst3 \
~/Library/Audio/Plug-Ins/VST3/ear-production-suite/
```

Substituting paths as needed if you have not installed to the default locations.

How to use (short version)

Import ADM Files

1. Select in the menu **File -> Create Project from ADM file -> Create from ADM using EAR**
2. Wait while all ADM elements are being created as tracks and automation curves along with metadata input plugins for each object or channel bed. There will be also tracks and plugins created for the Scene and the Monitoring.
3. Disable "Master send" for the **Monitoring** track routing and add your hardware output there
4. Enjoy :)

Create from scratch

1. Add an "EAR Object" Plugin for each audio object track or an "EAR DirectSpeakers" Plugin for a channel bed. Make sure to increase the track mapping parameter value +1 for each new audio object input plugin (or + the number of your channel bed). So the first audio object track in the REAPER session should be one, the next two, ...
2. Create a new track for the "EAR Scene" plugin and add it there.
3. Connect all audio objects tracks to the "EAR Scene" track as "Receives" in the I/O option. Make sure to choose the correct bus size (i.e. Mono).
4. Create a new track for the EAR Monitoring Plugin and add it there.
5. Connect the Scene track to the Monitoring track as "Receives" in the I/O option. Change the bus size to 64 (which is currently the limit for one Renderer plugin).
6. Add the hardware output for the Monitoring track in the I/O options.

7. Enter and author your ADM parameters in Object, DirectSpeakers and Scene Plugins. **Please note that the Scene Plugin is steering what you hear. So any items which are not added to a programme there, will not be rendered!**
8. Enjoy :)

Start with session template

1. Open template in REAPER
2. You will find a number of tracks with plugins for further usage
   - Two object tracks
   - One channel-based track
   - One EAR Scene bus
   - Two EAR Monitoring buses, one for Stereo monitoring and one for 5.1
3. The Scene Plugin has already two audio programmes, one called "English" and one "German"
4. All metadata connections between the plugins and I/O routings are set. You can start by importing your audio files into the tracks.
5. Switch between the different renderings by exclusive-soloing (CMD+Alt+Click (MacOS) / Ctrl+Alt+Click (Win)) the monitoring tracks.

How to use (long version)

Have a look at this video where these points are explained:

- Introduction
- Installation
- Tutorial 1: Understanding the EAR Production Suite Plugins
- Tutorial 2: Creating an ADM Project from scratch with the EAR Production Suite Plugins
- Tutorial 3: Using an Existing ADM File with the EAR Production Suite Plugins
- Tutorial 4: Using Third-Party Spatial Audio Plugins with the ADM Export Source Plugin
- Tutorial 5: Using Non-Object Audio with the ADM Export Source Plugin

Watch the video

Please note: The tutorial video advises to install the REAPER extension to the REAPER directory of `Program Files` on Windows. Although this will be functional, it is now advised to install to your user directory instead. Please see the installation instructions in this file.

Use of Binaural Monitoring plug-in

The Binaural Monitoring plug-in can be used in exactly the same way as the existing Monitoring plug-ins for loudspeakers; simply place the Binaural

Monitoring plug-in on a new 64-channel track and route all 64 channels of the Scene plug-in track to it.

The Binaural Monitoring plug-in supports 3DoF (three degrees-of-freedom). That is, the plug-in will respond to listener orientation changes. The plug-in provides Yaw, Pitch and Roll controls to define head orientation. These can be driven automatically using head-trackers which generate OSC. It is compatible with OSC message formats used by other third-party spatial audio plug-ins, including SPARTA/COMPASS, IEM, 3D Tune-In Toolkit, Ambix plug-ins, AudioLab SALTE, and Mach1 Monitor. Therefore, any head-tracker which is compatible with any of those plug-ins should also be compatible with the EAR Production Suite Binaural Monitoring plug-in. Below is a complete list of OSC paths observed. Note that you will need to ensure the Binaural Monitoring plug-in is listening for messages on the correct port using the control within the user interface, and enabled using the switch control.

- **/yaw *y*, /pitch *p*, /roll *r*** - Euler in Degrees, as used by SPARTA/COMPASS
- **/ypr *y p r*** - Euler in Degrees, as used by SPARTA/COMPASS
- **/hedrot/yaw *y*, /hedrot/pitch *p*, /hedrot/roll *r*** - Euler in Degrees, as used by HedRot
- **/rotation *p y r*** - Euler in Degrees, as used by Matthias Kronlachner's Ambix plug-ins
- **/rendering/htrpy *r p y*** - Euler in Degrees, as used by AudioLab SALTE
- **/orientation *y p r*** - Euler in Degrees, as used by Mach1 Monitor
- **/3DTI-OSC/receiver/pry *p r y*** - Euler in Radians, as used by 3D Tune-In Toolkit
- **/quaternion *w y z x*** - Quaternions, as used by SPARTA/COMPASS
- **/SceneRotator/quaternions *w x y z*** - Quaternions, as used by IEM
- **/quaternions *w y z x*** - Quaternions, as used by Unity
- **/head_pose** *a b c d* ***p y r*** - Euler in Degrees, as used by Matthias Kronlachner's Ambix plug-ins (note that the first 4 parameters are ignored in this case.)

The nvsonic Head Tracker provides a cheap, compatible and tested head-tracker which can output all of the above formats, and can therefore drive the Binaural Monitoring plug-in.

What's still missing

You are testing a beta version of the EAR Production Suite and some features are still under development or missing in this version:

- No support for Binaural and Matrix typeDefinition.
- Only currently supporting DirectSpeakers pack formats that are specified in the ADM common definitions.
- No support for "nested" Objects - on import, ADM Programmes are currently flattened to a single tier of Objects.

- Only one instance of EAR Scene should run on a machine at any time.
- Re-opening and exporting from a saved project using the FB360 plugins may produce incorrect ADM. This is due to a bug in the FB360 plugins which has been reported.
- ...

Issues

Before submitting a new report in Issues, please check if your problem or feature request is already known.