

LIFE IN THE TIME OF REFUGE

Roland Heap from Sound Disposition explains his first venture into producing sound for a virtual reality project

WORDS ROLAND HEAP PICTURES NOKIA/UNHCR

We had been researching VR projects for a while at the studio, and had generated a range of test projects looking at delivery platforms and methodologies. I'd done some recordings in ambisonics using Soundfield microphones whilst at university, so when this project landed at our door – courtesy of an old friend and collaborator, Thomas Maddens, who shot and edited the film – it seemed a perfect opportunity to put some of this theory into practice.

The film is an 11-minute documentary about a nine-year-old Syrian refugee who suffers from a debilitating hormone deficiency. Untreated for the three years he has lived as a refugee in Lebanon, Omar was resettled in Finland last year. The film follows his journey – from a refugee camp through to his new home. It's a highly effective use of the format, immersing you in the world of the young protagonist.

LOCATION SOUND

Thomas contacted me and the first thing I said was to make sure he took loads of location equipment – in fact I offered to lend him some of our rental stock, “It's too late,” he said, “we're already on our way to Lebanon.”

Fortunately, he took some sound equipment, including radio mics, probably the most important piece of sound equipment when working in 360. They were shooting on the Nokia OZO, a new and eye-wateringly expensive but very advanced 360 camera. It had been provided by Nokia, one of the sponsors of the film.

Capturing good sound for 360 video is incredibly tricky. You can't get a boom in (unless you can paint it out in post). Ambisonic recordings made on location are a good representation of reality but are rarely ‘cinematic’ too. For dialogue it's normal to rely



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on radio mics with all their problems. It seems a consensus was being reached that a combination of radio mics, thorough wild tracks, ambience recordings and an ambisonics mic underneath the camera gives filmmakers the greatest number of options in post.

Sadly, technical hitches on the shoot meant that the internal audio on the Nokia OZO stopped functioning shortly after the start of the shoot. We are not sure of the exact reason but it could have been something to do with the heat. Many of the locations were noisy and the dialogue was largely fairly distant too. Fortunately, the production team did a good job gathering most of the basics.

Once editing was complete, we received what materials were available via AAF but were faced with deciding what workflow to use.

VR AUDIO FORMATS

We knew the first screening would be in 5.1 in an Igloo outside the UN in Geneva, then shortly after they needed a version in first-order ambisonics (FOA) for headsets and

then FB 360 for Facebook. We decided to work in FOA primarily, decoding to binaural, but built a complex template in Pro Tools 12 which enabled simultaneous monitoring in 5.1.

The delivery formats dictated that an object and bed workflow would be best. We created ten sets of ‘object’ groups (generally one for each person on the screen). The audio we had from location was patchy at best, so we split out each character, tone-filled their audio and recorded Foley for each of their movements and footsteps. The dialogue, footsteps and moves were bussed together via a panner to become individual objects. Some remedial ADR was necessary in a few places; we were fortunate to have access to the main subjects of the documentary and really fortunate that they turned out to be good at ADR!

We used a suite of plug-ins – Harpex for ambisonics to 5.1 conversion (and vice versa), Audio Ease Altiverb for spaces, Audio Ease 360pan for panning in ambisonics, a few other plug-ins for converting between the various formats of ambisonics, plus all the usual tools for dialogue processing and spatialising. We also used Audio Ease 360monitor for hearing how the binaural headset mix would sound.

There were then a number of object tracks for ambient objects or spot effects that only comprised a few clips and didn't warrant a dedicated object group; for example, a rustling patch of grass would have a stereo grass rustle object assigned to it.

Reverbs were created in Altiverb and Revibe generally in 5.1 but

BELOW The Nokia OZO camera was used to film the documentary.



converting the planar 5.1 reverb returns to ambisonics using Harpex.

AUDIO DELIVERY

The delivery process was startlingly complex and tested and extended our already fairly thorough knowledge of video formats and methods.

For the first delivery, we took a visit to the Igloo company (IglooVision) who are based fairly near us in North London. The Igloos are tents with full 360 video projection, allowing a few people to simultaneously experience a 360 film without headsets, a very clever solution. For this we had to encode the video into an unusual format, using the Hap codec, and wrap the 5.1 audio into the stream for their players, for which we used FFmpeg. We listened to the 5.1 mix in situ as it would be heard by those at the UN, and adapted it after the first listen. Being almost perfectly circular, the Igloos have quite unique acoustics.

With the first mix safely delivered we then set about focusing on the second pair of deliveries – for YouTube and Facebook. For YouTube you can embed FOA audio, which was straightforward to create from our template, but it needs an unusual channel order and normalisation known as SN3D ACN. To create this, we used a freeware plug-in suite on Reaper to process our master FOA output. Once processed, you combine

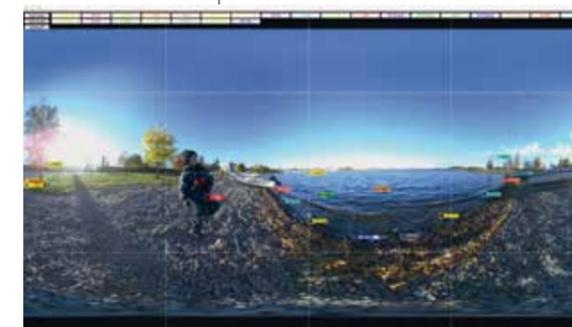
the FOA audio with the video in MP4 format, again using the wonderful FFmpeg. Finally, the video must be stamped with metadata which tells YouTube that the video is 360° and has spatial audio in it, which is done using a utility supplied by Google.

For Facebook you need to use the FB 360 suite by the company formerly called Two Big Ears. They were purchased by Facebook just under a year ago and now their software is freely available. Their plug-in suite involves panners and converters plus an encoder, and outputs a hybrid variant on ambisonics which has both a spatial ambisonics mix but also a head-locked stereo which can be used for music, voice-over or anything else you want to remain static. In our case, as we had music and voice-over, we decided to use this functionality for both. The two resulting files are then wrapped into an MP4 file, along with the video and some metadata, by a standalone encoder app.

With all the conversions, to and from, the session ended up being pretty processor-intensive – by this point our template was enormous!

DOLBY ATMOS

We had assumed this would be the end of the project but then we had word from Triggarr, the company that manages the UNVR app, that they needed a different version. To our surprise this had to be delivered in



ABOVE The overlays on this shot are the panning ‘pucks’ used to map objects to the visuals. Part of the 360pan suite.

TOP A typical timeline for the VR project.

» Watch the VR film on FB 360 here: bit.ly/2kAkxNA on YouTube 360 here: youtu.be/XI9A6mQdMCQ or download the free UNVR app for Android and iOS.

Dolby Atmos VR, a technology still (I think) officially in beta. Luckily I have friends at Dolby and was granted access to the beta programme at short notice. The Dolby Atmos VR software is a variation on the full Dolby Atmos software which we've used in the past on feature and short films.

Unfortunately, the panning plug-ins utilise different axis settings to any of the other panners we were using, so pans had to be painstakingly recreated, but the session layout utilising objects and beds served us very well indeed. Exporting was relatively straightforward and mixed the resulting audio into a MP4 file.

All in all, despite challenging source material we're very happy with the outcome, and the project has given us a fantastic experience of delivering to a wide range of platforms; experience which has influenced the way we've approached all of the VR and AR projects since. ☑