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ARENA EVENT WITH 500 MUSICIANS

Disney 100

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Photo: @urbanmythology

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The Walt Disney Group celebrated its 100th anniversary with concerts that brought the soundtracks of numerous Disney and Pixar films to the stage in the form of a light show with video projections.

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It's Disney!" replies Product Manager Consultant Emmanuelle Husson after a moment's thought with half a smile at the question of how it is possible that two orchestral concerts, each with an audience of 26,000 people and featuring music from Disney's movies, could be sold out in advance. The reason for the event spectacle that amongst others included the soundtrack of Disney's fairy-tale classics as well as Pixar and Star Wars movies was the Walt Disney Group's 100th anniversary celebration. Festivities were also held at nearby Disneyland Resort Paris; however, the orchestral music event was independent of these. The concerts took place on a weekend in November 2023 in the "Paris La Défense" arena. Also the stadium of rugby club "Racing 92", it features a closable roof and is located in Paris' western suburb of Nanterre. Several set-up days were planned for the events that were to feature a complex stage accommodating around 150 orchestra and band musicians as well as a 350-person choir. A large video screen was positioned above the musicians. These displayed mostly movie clips that matched the respective music. Two smaller video screens flanked the stage to both sides, where live images of the musicians were displayed. The set-up was complemented by a complex light show.

Personal mixing using venue mission

On the evening before the first concert, a dress rehearsal with all musicians took place. Emmanuelle Husson, an external service provider who, with her company Radioactivités, creates monitoring concepts and handles radio transmission and audio-over-IP applications, was responsible for the musicians' in-ear setup along with her assistant. For this purpose, Husson relied on Merging Technologies Anubis interfaces combined with the "Venue Mission" software for personal mixing. This software was developed and programmed by Husson together with Florian Baume, Senior Software Engineer at Merging Technologies (the company was acquired by the Sennheiser Group in 2022). According to Merging Technologies, the application offers an optimised workflow with unprecedented control over the overall audio system. Venue Mission, explains Husson, was developed for complex monitoring setups such as the upcoming



Interface in the personal mixer mode for violinists Here, for example, users can adjust the stem components for rock band, jazz band and presenter

ing orchestral performance. "I came up with the idea because I wanted to reduce the number of cables on the stage," says the developer and adds that she liked a tidy stage. Additionally, this way, musicians feel comfortable with their own mix. In the development process, feedback from musicians and technicians has been incorporated and the software has been available since October 2023.

The concept: two adjacent musicians share one interface. Two separate in-ear mixes are available that performers can mix from the stems themselves. The display can be switched between the two mixtures. One advantage: the two instruments' own microphone signals are fed directly into the interface's preamp, enabling very low monitoring latencies for the musicians' own instruments. Only one RJ45 cable is connected with the monitor and FOH desks. All signals – the microphone signals to the desks and the stems for the respective in-ear mix – are bundled in this cable. From her control room backstage, she can listen to the respective mixes, Husson explains, while the musicians receive their mixes via Shure SE215 ear pods. Up to 16 mixable channels (mono or stereo) are possible in the interfaces. For the Disney concerts, the stem signals – violin, cello and double bass each as a section, plus jazz band, rock band, percussion, choir, click signal and presenter – were created using a DiGiCo SD5 console located backstage, alongside a second SD5 and an SD12 console. One device was used for the orchestra section mentioned above, while another was responsible for the lead vocals and the third was dedicated for

the 48 microphone signals of the 350-person choir. The choir singers only had in-ears with a click signal to sing to the film sequences – they did not need a further mix and therefore did not have their own dedicated personal mixers. In total, 42 Anubis interfaces were deployed on stage and another one backstage for Emmanuelle Husson to check.

“Each interface was used by one or two orchestra musicians. The percussion section, the choir as well as the rock and jazz band used a different system – a DiGiCo stage box and Sennheiser EK1039 monitor systems,” says Florian Baume.

Anubis interface for a range of different applications

The software was developed specifically for the compact Anubis interface that features two combined microphone/line sockets (with phantom power) as inputs, two additional analogue line inputs via jack (alternatively, two Hi-Z instrument inputs can be switched), two XLR line outputs and two jack line outputs. An internal talkback omnidirectional microphone is also available. The two mixes are output to the musicians’ ear pods via two headphone connections on the front. An RJ45-compatible Ravenna/AES67 connection (Gigabit Ethernet) allows for

digital routing and, should it be required, PoE (Power over Ethernet) power supply. The latter can be operated instead of or as a redundancy to the conventional power supply connection. An alternative version (Anubis SPS – “Seamless Protection Switching”) offers two RJ45 connections as redundancy for example for broadcast applications. The specifica-

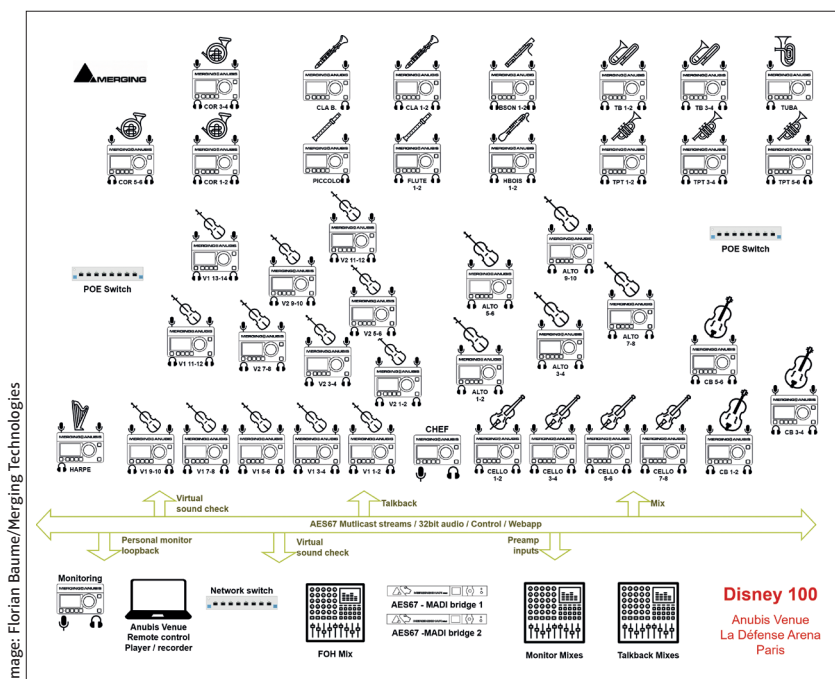
»We save a lot of time for monitor mixes – and we save batteries for the musicians’ in-ears. «

FOH Sylvain Denis on the Anubis system with “Mission Venue” software

tions are promising: while the internal microphone preamplifier’s input noise is specified at -128 dB(A), overall, the interface offers a high dynamic range of 139 dB(A) for line signals. Additionally, the pure AD/DA latencies, according to the manufacturer, are 0.38 ms (48 kHz); network use adds additional latencies. The “Pro” version offers sampling rates of up to 192 kHz, while the “Premium” version supports sample rates of up to 384 kHz or DSD256.

When it comes to the hardware, Merging Technologies offers various so-called software “missions”, in other words operating modes for specific use cases: “Music Mission” is for music production, podcast and content creation, “Monitor Mission” is for mixing and mastering in stereo, surround and any immersive formats, “Commentary Unit Mission” turns the Anubis interface into a live commentary broadcast signal centre, and “Venue Mission”, as described, serves as a novel solution for complex stage signal/personal mixer routing.

Emmanuelle Husson appreciates the device’s features and technical specifications. The “Venue Mission” was added as an alternative to the “Monitor Mission” to simplify the user interface and provide an overview for musicians in complex applications. Here, users cannot access setup and advanced setting options. However, these settings can be configured remotely, explains Florian Baume. In the on-site setup, the Anubis interfaces were connected to the DiGiCo consoles, while the AES67 streams were routed via a MADI bridge. For



Setup diagram of the 42 Merging Technologies Anubis interfaces along with the monitor consoles

Largest performer show in Europe

For the „Disney 100“ anniversary concert, the French-based „Sinfonia Pop Orchestra“ was responsible for the music and scenic design as artistic and executive producer, together with the production company G1 Production. Founded in 2009, the orchestra is on tour with film music adaptations. „We had already been on tour with the ‚Disney in Concert‘ show for three years,” explains Jean-Philippe Fournier, artistic director of production company G1 Production and production manager of the Sinfonia Pop Orchestra, “so Disney didn’t approach us directly and ask for a concert tour – it was already happening. We knew that Disney’s 100th anniversary was coming up in 2023 and it was clear to us that we should organize something bigger for such a milestone. For this, we worked with both Walt Disney’s French and US branches to create the show.” There was no general artistic concept in advance, he explains. “We started from scratch. The show is a completely new design by the Sinfonia Pop Orchestra, the music was rearranged and orchestrated for it. We decided to build the artistic concept around the choir – that was our central starting point. Hence, our standards were high. Last July, we contacted eight different choirs.” The overall size of the choir and musicians was also determined by the available space. “The Paris La Defense Arena is probably the largest venue in Europe in this respect. We



Image: @urbanmythology

Mickey Mouse acts as conductor during one piece of music

therefore had to put on a big concert with lots of musicians, choir singers, dancers and singers – an event that people would remember.” There were also no fixed criteria when it came to selecting the movie sequences. “We just had to decide on the largest possible set list that would ideally please every Disney fan. We wanted to include every important movie that has made an impression on audiences over the years.” First, they finalized the musical arrangements and then sent them to Disney. “Disney then provided us with the respective movie material. We then linked the movie sequences with the music

and edited them so that they worked in sync.” The aim was never to condense the storytelling of each movie into the length of a song. “Our audience knows the movies. As musicians, we try to spark emotions with our music.” According to Fournier, combining this with Disney’s much-loved movies in concert is a particularly successful combination. “In the end, we just want to make every member of the audience happy with the movies of their childhoods.”

For the subsequent tour, it was necessary to reduce the number of musicians according to the size of the venues. “As we have been organizing tours for many years, it was clear to us that we had to reduce the number of string instruments – violins, violas and cellos – in particular.”



Event as a work of art Musicians along with the three screens; in the centre, sequences of the Pixar film “Up”; the event is framed by the light show’s “Mickey Mouse Ears”

the latter, two Merging Technologies HAPI network audio converters were used. The MADi bridge was connected to an Optocore loop in order to integrate the DiGiCo consoles.

“Every cable we can do without is an advantage”

FOH man Sylvain Denis remembers the origins of the concept with Emmanuelle. “Three years ago, we had a big recording session in Strasbourg for Warner Classics. We brought all kinds of Merging Anubis equipment with us, and a senior engineer from Merging was also present. We tried out the concept – it seemed like a good solution! Previously, we had needed a preamp for the musicians as well as in-ears. The Anubis interface saves us the battery for the musicians’ in-ears. The digital conversion also takes place after the internal preamp, in other words, practically directly at the microphone. No interference noise is caused in the further signal

Paris in early summer. “The setup was very quick and very easy for the musicians on stage to work with.” Especially when it comes to concerts with a lot of performers, Denis sees the benefits of reducing the number of microphone cable runs: “Every cable we can do without is an advantage.”

Redundant console for 400 microphone signals

Two DiGiCo Quantum SD7s were located at the FOH, with Denis in charge of the main console and his colleague Florian Siegwald handling the second. “Florian provides me with a lot of pre-mixes – of the vocals and the band”, says Denis. “Everything goes through my console, through the d&b Soundscape software. We practically share the orchestra, the choir, individual lead singers, the entire band and extra music and sample tracks, such as the Mickey voice” – a reference to a performer in a Mickey Mouse costume, who makes pan-

tomime movements to pitched-up pre-recorded announcements. “The concept was important to me right from the start: if something happens to my equipment, we should both be able to transfer all signals to the other console. With around 400 microphone signals – wired and wireless – it’s easier to switch from one console to the other this way. Otherwise, you would possibly have to switch a lot of layers!”

How did both approach the mix? “We programmed a few macros – mostly effects, like reverb. Mute/unmute for groups or layer recalls for specific microphones, groups or VCAs.” In addition, a “hands-on” approach applies to the Disney performances, says Denis: “Working in snapshot mode is ‘risky’ for just two shows.” In the short time on site – a dress rehearsal, followed

by the concerts – the processes were still being finalised. “You don’t have enough time to programme everything – so it’s better to have everything ‘at hand’. That way you can change everything at the last minute if you need to.”

The Disney performance was probably the biggest performer show in Europe, he speculates. What was the biggest challenge for a mix with so many musicians? As is so often the case, it was the location’s sound, says Denis. “For me, this kind of mix isn’t a really big deal – I do orchestra and choir all the time. The main problem was the venue and how it reacted to the music. In smaller venues with 2,000 seats, the difference between the empty and the full location is already



FOH Team Florian Siegwald (FOH pre-mixer for vocals and bands), Sylvain Denis (FOH), Titouan Brule (d&b Soundscape Tech Engineer)

path. It is also very easy for the musicians to adjust playbacks, the orchestra, their own instrument, the click volume or the conductor’s microphone volume. This saves us the time of having to create an in-ear mix for the orchestra musicians and having to satisfy everyone – which isn’t possible anyway,” he says with a grin. “With a project of this size, we would normally make five or six different mixes for the orchestral musicians – but even that would be too much work, because you’d always have to go back and forth and the musicians would have to agree among themselves on who wants to hear which parts.” In 2023, individual tests for live shows took place – for example at a Louis Vuitton show during the Fashion Week in

quite large.” He mentions the word “audience damping factor”. “Add a 28,000-strong crowd and the difference is all the more enormous. A venue’s sound might be rather boomy and shitty when empty, whereas it might sound good with a crowd. It’s always a little tricky to explain to a promoter that he has to be patient until the concert itself to get the final impression,” he adds with a grin. Feedback was not a problem, as

he, for example, did not have to increase the choir’s individual signals. “It’s easier with a 350-person choir. If we had had only 20 singers, it would have been difficult to raise the choir over the orchestra. At the same time, a masking effect occurs: I get an ‘average voice’ from each section. Even if an individual isn’t singing quite ‘in tune’, this goes unnoticed in the overall result.” It is the same effect as when a stadium audience sings together.

“As far as I’m concerned, for shows like these – more than for others – you have to be 95 percent prepared in advance. Of course, I still have to make adjustments on the spot – volume, pan, EQ, that the sort of thing – but everything is basically ready to go. This way, you don’t waste time on the setup itself. You could otherwise spend a week organising everything until you end up with something! I’m certain that when the orchestra goes on stage, we’ll have a sound that probably won’t sound incredibly good yet, but it will already be quite clear and basically okay.” The rest, according to Denis, was the fine-tuning of a concert that he did not expect to be particularly loud. “I think the show will have 85, maybe 90 dB, no more. It will be pleasant. Lots of children will be present; each concert lasts two times an hour and a half. There is no reason to have 100 dB like at other venues and thereby figuratively kill everyone with noise! The general rule for a PA is: you’ll get a good sound if it’s not too loud.” Otherwise, too many problems would arise such as too many reflections in the location. “That might still work for a pop/rock band, but here I have hundreds of microphones on stage. Feedback would be transmitted hundreds of times. It would be a lot of feedback.” He laughs.



Light spring tension Neumann MCM KK14 on a violin; the special gooseneck is designed to prevent damage to the instrument

50 Neumann MCM clip microphones for the strings

Most of the microphones on stage were condenser microphones: the choir was picked up using 48 Neumann KM184 small diaphragms. Neumann TLM102 and TLM107 large-diaphragm microphones were deployed for the wind instruments, while the woodwinds were

miked using Schoeps CMC6 small diaphragm microphones. The drums and percussion saw a mixture of AKG C414 large-diaphragm condenser microphones as overheads and DPA 4099 clip-ons on the toms, plus dynamic microphones on the snare and bass drum. Broadcast microphones with Shure Beta 58 capsules were used for the presenters and singers. A special feature: the almost 50 strings – violins, vio-

»It’s easier with a 350-person choir. If we had had only 20 singers, it would have been difficult to raise the choir over the orchestra.«

FOH Sylvain Denis

las, cellos and double basses – along with the harp were all miked with the Neumann MCM KK14 Elekret microphones, which was the first Neumann clip microphone to be launched in 2022. Sylvain Denis himself owns one of these compact microphones. „Last year, I went on a Harry Potter concert tour for which Neumann gave me 15 devices. I really like them.” For the Disney show, the two companies responsible purchased 50 MCM mics based on the show’s booking. “To me, it sounds like a small overhead above every instrument. For the piano, we used DPA 4099 models. In my opinion, DPA microphones are very focused in their response.” He is referring to their hypercardioid characteristic, while Neumann chose the cardioid characteristic as a suitable compromise between sound colour and directivity. Alternatively, with the KK13, a spherical capsule is also available.

"The DPA is very directional, especially when it comes to high frequencies. If the musicians don't align the microphone on the portable instruments in exactly the same way, the sound changes. Sometimes – with the cellos, for example – you get an interesting sound if you don't choose the same mic position for all instruments." According to Denis, this results in an ideal "average sound" for the cellos, which reproduces the instruments very naturally. "If every cellist's mic is located on the instrument's side in the direction of the double basses, I would get a 'boomy' sound."

The "insensitivity" to alignment simplified working with the MCM models on stage. "You just have to check whether the microphone is in roughly the same place and whether it's pointing towards the instrument – that's basically enough." In the mix, Sylvain used a low cut for the microphones that depended on the respective instrument. For this, he cut slight resonances around 200 Hz, which represents the hall's resonance frequency. What, in his opinion, was the difference to the use of DPA devices? "With the MCM microphones, I don't have to use shelves in the highs in order to reduce the aggressiveness in the sound that is caused by the directionality and the proximity of the microphones to the instruments." Denis and Husson appreciated the retaining clips for the

string instruments. Sylvain Denis: "The clips are better than those offered by other manufacturers. With many others, you have to push the clip apart. Here, a spring tension is integrated that can be used without having to apply strong pressure." Emmanuelle Husson demonstrates the spring mechanism for the violin. "Musicians can handle the clamp easily and can attach it to the instrument themselves." This was important, as musicians are particularly sensitive to

»To me, it sounds like a small overhead above every instrument«

FOH Sylvain Denis on the Neumann MCM clip microphones

clamps that are fixed to their instrument, especially when it comes to string instruments. For the musicians, she attached a bracket to their seats where they could hang the microphones. She made it using a 3D printer.

At FolkBaltica's opening concert in Sønderborg, Denmark in 2022, Neumann owner Sennheiser supported the production by providing the MCM KK14 for a major practical pre-release test (see Production Partner 6/22). In addition to the participants' enthusiasm, there were some small features regarding the prototypes that offered room for optimisation:

for example, the violin clamp's spring tension had slackened after the prototypes had been used several times. When asked, Stephan Mauer, Head of Product at Neumann, confirmed that the problem had been resolved by the time the series' production had started and that the series parts' spring tension now offered long-term stability. The belt clip, which was practically only clipped on at the time, also came loose on individual microphones in the run-up to the FolkBaltica concert. "The groove into which the belt handle engages has been optimised for the series, so that the belt clip now sits much more firmly on the main part," says Mauer. A further choice that had been

made deliberately: The cable connection to the gooseneck comes loose easily under tension. This decision was made to



MCM-100 output stage in wired operation. If necessary, the jack connection can be fixed using a clip supplied, otherwise it releases under tension to prevent damage of instruments through falling if someone stands up and forgets the wiring

prevent the instrument from being ripped out of the hands of a musician who forgets the cable and moves away. At the concert in Denmark, the weak connection was initially criticised by the staff as a “flaw” until the concept was explained. At the time, the cables were secured using tape. The standard version now also comes with a cable clip. This can be used if needed, it secures a reliable connection, is easy to open and close and can also be removed if necessary, explains Mauer. It has been received very well by the market. The system is available with various cables to connect all common transmitter systems without users needing an adapter. Cables include a 3.5 mm jack plug, Mini-XLR 4-pin, Lemo and MicroDot. If users want to use the microphone in a wired set-up – as was the case during the Disney event – they will need the MCM100 output stage that is connected using a 3.5 mm jack plug.

“Tidy” acoustic impression even in the empty hall

Due to the manageable volume, the acoustic impression was already tidy and pleasantly enveloping during the dress rehearsal in the empty hall, without excessive bass resonances or annoying flutter echoes and reverb tails. The orchestra and band seemed to have been “cast from the same mould”; the result gave a fully produced impression without sounding artificial. The light show occasionally set the stage for the orchestra. In most cases, however, it remained restrained and served as a background for the edited film sequences, which included “The Little Mermaid”, “An American Tail”, “The Jungle Book”, “WALL-E”, “Snow White”, “Lady and the Tramp” and “Star Wars”. For “Cars”, a hard rock interlude was played by the rock band section; in another case, a jazz band served instrumental bar jazz. For this, the piano and wind instruments were arranged on a stage platform to the left of the audience, while the rhythm section consisting of drums, bass and electric guitar were positioned on a separate platform at the right end of the stage. For “Pirates of the Caribbean”,



corresponding live-action film clips are projected and an actor dressed as Captain Jack Sparrow moved through the audience area. In between the film snippets, there was a presenter, individual songs were sung, the aforementioned Mickey Mouse character entered the stage and in one case also conducted the orchestra. The event was rounded off with dance performances by various groups as well as artistic performances by two ballet acrobats climbing up a garland towards the hall’s ceiling.

According to those involved, the concert event weekend was a complete success. The musicians were blown away by the convenience offered by the personal monitor solution, says Florian Baume. Sylvain Denis was equally impressed by the event. “The power coming from the stage was incredible,” he recalls. “I didn’t have any particular problems. We just had to adapt the singers’ movements, as they were changed right up to the last moment. But as we were prepared for this, it wasn’t a problem.” Given a further edition, he would not really change anything – “apart perhaps from 128 objects in d&b’s Soundscape programme that are not yet available ‘in the box.’” Denis was only responsible for the two on-site shows. After the event, the production “only” needed to be scaled down for the upcoming tour, which will see Disney’s film scores touring across Europe with around 100 musicians including 20 choir singers. The show can be seen in Germany, Austria and Switzerland in April and May 2024. ■