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Harvey in the Bonn Opera

For four years now, Berlin-based company Dspecialists' audio and media control matrix has been on duty at the Bonn Opera – completely unobtrusive in a control room's 19" rack. As Berlin's former Governing Major Klaus Wowereit would probably say: "And that's a good thing."
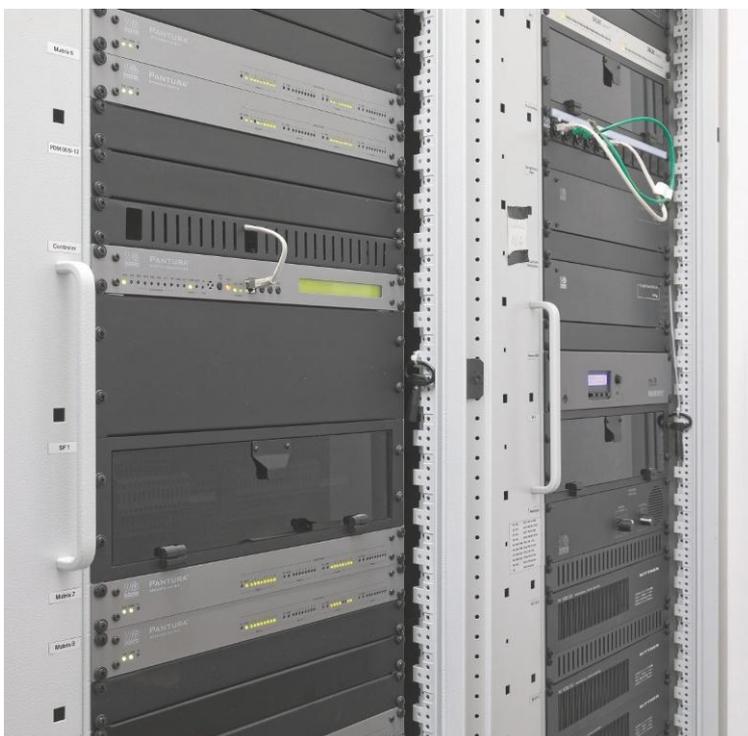
Harvey mx.16 is a 7 kg 19" unit that requires 2 RU for rack mounting.

The Harvey Composer software is installed on a computer in the control room.

The Bonn Opera's control room with several man-high racks.

Anyone who ponders the headline and briefly has doubts about their own cultural competence can lean back and relax: Harvey is not the forgotten early musical work of a well-known composer – rather, Harvey mx.16 is Berlin-based Dspecialists' audio and media control matrix; a matrix, which has been operating reliably at the Bonn Opera for about four years. The visually rather inconspicuous 19" device was installed as part of a comprehensive overhaul of the in-house stage manager's system. This modernisation was carried out by specialists from Salzbrenner media, a system house for audio, video and media technology, during the summer break in 2014 – all within a tight schedule.

What does Harvey have to do with Hollywood?

"The name Harvey goes back to the movie 'Harvey' with James Stewart," reveals Jochen Cronemeyer and looks in somewhat stunned faces. The main shareholder and Managing Director of Dspecialists Digitale Audio- und Messsysteme GmbH, a company which is celebrating its 15th anniversary in 2018, explains: "When we were looking for a suitable name for our device, it was clear from the start that it would eventually be installed in a 19" cabinet and would serve there for many years or even decades. What do you call a device that is, so to speak, 'invisible'?"

To explain: The main character of the US movie "Harvey", a motion picture based on a play of the same name, is accompanied by a more than two meter tall rabbit named Harvey. While Dowd speaks with Harvey, the rabbit is invisible to others present. "So Harvey is just the right name for an invisible friend: You can't see him, but he's always there, doing his job," Jochen Cronemeyer notes with a smile.

Symbiosis of audio matrix and media control

Harvey mx.16 combines complex audio signal processing with media control – "the best of both worlds" as marketing specialists would probably say. The audio matrix including DSP functionalities is freely configurable using Harvey Composer software. The operation is car-

ried out by drag&drop: individual processing modules can be placed and connected at will within the scope of the existing DSP capacities. Successful configurations can be stored as presets within the system.

The media control section offers various options that can, for example, be used in smaller conference rooms. "In installations such as these, all a customer needs is Harvey. A purchase of separate controllers for the lighting or media equipment is not required", says Jochen Cronemeyer about the underlying concept, and adds: "The configuration works with two layers: One layer is responsible for the audio part, while the other is assigned to the media control functions." Dspecialists distributes Harvey mx.16 directly by since 2013. Since then, more than a dozen distributors have been added worldwide. Jochen Cronemeyer is very pleased with the very good response and additionally points out that "Made in Germany" ensures a high reputation and is understood as a quality feature – particularly in Asia. All devices are developed and manufactured by Dspecialists in Germany.

The price-performance ratio seems attractive; especially since, depending on the scenario, Harvey, with its wealth of functions, can handle all tasks without the support of external processors. Special customer requests can be met, as long as the software developers are given sufficient time. As new algorithms for audio signals processing are continuously developed, customers have the ability to update their existing devices.

What features does the hardware offer?

Harvey mx.16 is a 7 kg 19" unit that requires 2 RU for rack mounting. The tidy grey front panel contains a two-line LC display flanked by four multifunction buttons, whose respective functions can be read on the screen display. To the right of the display there is an endless rotary encoder and a red "alarm" LED. A front headphone outlet is also available. The cold mains connection including the on/off switch is located on the rear side. Additionally to an Ethernet port (RJ45), RS232 and RS485/DMX are available as interfaces for remote control as well as for exchanging control commands between Harvey and external components such as lighting and sound systems, media technology or control panels. Eight voltage inputs are additionally included as are eight optocoupler inputs. Four relay outputs for switching external components extend the range, with contact 1 being the fault signalling contact.

On the audio side, Harvey mx.16 features 16 line inputs; the first eight of which can be configured as microphone inputs with +48V phantom power. As audio outputs, Dspecialists has included 16 analogue connectors with line level. Optionally, cards with CobraNet or Dante interfaces can be ordered. The algorithms are designed for signal processing with a sampling rate of 48 kHz; the A/D and D/A conversions follow with a width of 24 bits.

Harvey brings listening microphones together

Alexander Kissler, Product Manager / Sales Support at Salzbrenner media with headquarters in Buttenheim, Germany, recalls the reconstruction of the stage manager system in 2014 and the associated challenges: "Large parts of the out-dated technology had to be replaced and parts of the inventory preserved, which was not an easy task within the tight timeframe. Only six weeks were left for the dismantling of the existing stage manager's desk, the installation of light signals and signalling lights as well as call and monitoring loudspeakers, and the commissioning of the intercom and video system. There was no turning back!"

In connection with the construction work, numerous 19" components were accommodated in the Bonn Opera's central control room. Several man-high racks are located here, in which Harvey mx.16 too found its place. "The output signals from the monitoring microphones installed in the Main Hall and the workshop stage meet in Harvey," explains Alexander Kissler. "The editing options provided by the device are helpful in this context: "In the canteen, for example, the noise level varies greatly depending on how many people are present and whether food is being eaten or not. In the past, the listening level in the canteen was generally either too loud or too quiet, depending on the setting. We solved the problem by capturing the noise level using two microphones on both levels of the canteen. Harvey utilises these as control signals with the so-called Ambient Noise Control algorithm operating in the background. The output is ensured at the desired locations in the house via loudspeakers, which are integrated into a 100V system."

Ambient-Noise control works invisibly in the background

Ambient-Noise control is in principle an elaborate ducking algorithm, which can be sensitively adapted to the concrete task thanks to a clever parameterisation. If the dishes in the canteen rattle for a short time, the loudspeakers' level should not rise into the immeasurable immediately. Ideally, the regulation processes should be designed in such a way that those present do not consciously perceived them.

The installation in the Bonn Opera is far from using all of Harvey's extensive capabilities – for example, the device's control options are not relied upon at all in the Rhenish federal city. Harvey mx.16 is rather addressed externally via the PerformanCeTRL control system; a control system, which has been developed by Salzbrenner media. For the company, the installation at the Bonn Opera was not the first cooperation with Dspecialists. Alexander Kissler speaks of "interesting products" and is certain that Salzbrenner media will continue to work successfully with Dspecialists in the future – especially as various new developments (see below) cast their shadows ahead.

Set & Forget

Apart from special effects, opera performances do not usually require electroacoustic amplification. However, in this case, the musical in-house productions regularly performed in Bonn make use of the existing sound technology. Dance performances must also be accompanied by suitable "canned background" or live music. The Bonn Opera's Great Hall, which still exudes the special charm of the 1960s, seats more than 1,000 people.

Left to right:
Alexander Kissler,
Elisabeth Thomann
and
Jochen Cronemeyer.

BONN OPERA

The Bonn Opera House is located directly on the banks of the Rhine near the Kennedy Bridge, which connects the city centre with the Beuel district. The architecturally idiosyncratic building with a striking outer skin of scale-like metal plates was built between 1962 and 1965 as a municipal theatre according to the plans of the Stuttgart architects Klaus Gessler and Wilfried Beck-Erlang.

"Harvey mx.16 is located in a 19" rack in the basement and requires no further attention during operation", reports Elisabeth Thomann, who has been with the opera house for 15 years and holds the position of Head of Sound Engineering – her statement supports Jochen Cronemeyer's "invisible friend" analogy. Thomann continues: "I've already worked with Harvey's software for example to create a tone generator and a level meter when we troubleshoot an issue within our aged network – the surrounding I created in Harvey Composer has made troubleshooting easier. The software is installed on a computer in the control room. The user interface is clearly laid out, which is an advantage if you only access it once a year and then, of course, do not necessarily remember all the functions. So far, I've always coped well, and there was no need to deal with the manual intensively."

Extended product portfolio since 2018

Just in time for the company's 15th anniversary, Dspecialists Digitale Audio- und Messsysteme GmbH has added a new generation of modular devices to its Harvey mx.16 audio and media control matrix series. To begin with, "little brother" Harvey 8x8 (1 RU) extends the product family – a device, which also features various control options via serial ports, Ethernet and DMX and supports Audinate's Dante protocol. The new concept also allows further configurations such as 4x8, 24x4 or 16x16. Furthermore, a digital I/O card (AES/EBU) is about to be launched on the market.

The internal signal processing capabilities are extended by the latest generation of DSPs, SHARC ADSP-21469. Additionally, the Berlin-based company is also considering complex algorithms, which for example are intended to provide particularly sophisticated echo cancelling and a method for 3D audio. The current converters support sampling rates up to 192 kHz, whereby the software algorithms are initially designed for 48 kHz. Jochen Cronemeyer explicitly emphasises the very good signal-to-noise ratio as well as the low, constant latency and can imagine Harvey applications even in demanding recording studio environments. One of the new Harvey family members' special features is that the inputs and outputs can be freely configured in groups of four, with the desired assembly being carried out ex works.

The extended portfolio is rounded off by the RC4 hardware remote control, which features four backlit buttons as well as a large endless encoder with push function and associated LED ring and can be connected via network cable. Power is supplied via PoE. The design has not yet reached its final shape and it is possible that, in addition to a functional plastic version, a luxury version with a particularly high-quality appearance will also be offered for use in corresponding environments. Jochen Cronemeyer and his dedicated team will certainly not run out of ideas for their "invisible friend", especially as the company always has an open ear for the needs and wishes of existing and potential customers. //

Originally equipped with 900 seats in the Main Hall and 180 seats in the so-called "workshop", the building is able to accommodate up to 1,037 guests since the auditorium was extended in the season of 1992/93. One of the artistic peculiarities of the Bonn Opera is the auditorium's lighting consisting of a lowerable "luminary Milky Way", which was designed by Otto Piene, as were the remarkable chandeliers in the parquet foyer. Opera and musicals are performed in the Opera House, which belongs to the municipal theatre. International dance guest performances can also be experienced on a regular basis.