



### **The Sennheiser MKH 416 shotgun microphone is 50**

**Sydney, Australia, March 2025** – One of Sennheiser’s most revered microphones, the MKH 416 P48 shotgun microphone, celebrates its golden jubilee this year! For 50 years, the MKH416 has accompanied broadcasters, filmmakers, voice-over artists, and content creators; it has been used in studios and in the field. Mounted onto a boom pole, a stand or a camera, its job has been to stay outside the camera angle while gracefully capturing sound with clarity and impact.

#### **Time travelling to the 1970s**

The name of Manfred Hibbing is firmly linked with this milestone product. When the young engineer joined Sennheiser, his first task was to design the MKH 416 P48 on the basis of the MKH 415 T. The MKH 416 was to be Sennheiser’s first phantom-powered (P48) shotgun microphone, while all previous models were AB-powered. In those days, AB powering was preferred in broadcast situations because of its resistance to ripple voltages, but phantom powering had become established in the studio.



### **50 years old but always up to date**

Hibbing's involvement was a stroke of luck for the MKH 416 RF condenser microphone, as he possessed ample expertise both in electroacoustics and in RF technology. In an interview in 2023, he said that optimising the interaction between the electroacoustic transducer and the electronic circuit had been his favourite task in designing the 416.

The long lifespan of the MKH 416 P48 fills the engineer with pride: “During all this time, the design of the MKH 416 was only revised in two instances: one was to make it suitable for SMD mounting, and the other to update it for a more advanced transducer technology.”



Manfred Hibbing with the MKH 416. The photo was taken in 2023

### **A standard in the studio and in the field – but why exactly?**

One reason is that the MKH 416 operates on the RF condenser principle. In this context, RF (radio frequency) has nothing to do with wireless, but rather refers to the high-frequency voltage at the capsule and the associated electronics in the microphone. The huge advantage of this design is that it makes the condenser microphone resistant to humidity. Unlike “standard” condenser microphones, RF condenser models can be used outdoors, in hot and humid or cold and misty weather. MKH microphones have reliably recorded audio in a wide variety of challenging locations, from deserts, to the Arctic, to rain forests.



RF condenser microphone used in outdoor broadcasting



Another reason for the success of the MKH 416 is in its excellent directivity, which is the result of the acoustic interference principle on which it operates. The actual microphone capsule is combined with a so-called interference tube in front of it. This tube has regularly arranged slots, which are covered with fabric that has a certain acoustic impedance, and prevents reflections and standing waves inside the tube. If sound arrives directly from the front, the interference tube has no effect at all. But when sound enters the tube from the sides, it passes through different holes. This results in different path lengths to the transducer and thus different time delays. Depending on the angle of sound incidence, the sound components more or less cancel each other out. This effect increases at higher frequencies: Here, the microphone essentially picks up the sound coming from the front. This is particularly important for speech intelligibility as the decisive speech formants are recorded with less lateral interference at high frequencies than with standard microphones.

The MKH 416 offers a perfect mix of directivity and climate-proof design





The longer the shotgun, the more this interference principle extends to lower frequencies. Unfortunately, the longer length also makes the microphone more difficult to handle. The MKH 416 is certainly so popular because, despite its short length, it offers an effective directionality. How this particular length came about is its own story, and that takes us back to its predecessor, the MKH 415 T...

### **The hacksaw and the microphone**

In 1970, the newly designed MKH 415 shotgun microphone was the pride and joy of the Sennheiser development engineers. It was less sensitive to wind and pop noise, had greater resistance to handling noise, and excellent directivity. With the new microphone in his briefcase, an enthusiastic Dr. Griese, technical manager at Sennheiser, went off to visit radio and TV broadcasters. The customers showed a great deal of interest in the new shotgun microphone – but couldn't resist picking at it. They complained that the shotgun effect was so strong that you had to keep moving the microphone to follow the speaker around.

Dr. Griese, then Sennheiser's Technical Manager, was an engineering genius with a sense of humour



Dr. Griese listened to the comments for a while and then asked for a hacksaw. "How much directivity would you like?" he asked the amazed observers. And without batting an eyelid he proceeded to saw off a section of the microphone tube. The customers were stunned. Dr. Griese then tried out the shortened microphone once again and, to everyone's amazement, it was perfect! From then on, the MKH 415 – and thus also the MKH 416 which followed its design – were highly successful as the preferred microphone for vocalists, film teams and reporters,



with the specialist media being equally impressed by the “unusually short length” (*Funkschau*) of the shotgun mic.

## Conclusion

“The MKH 416 remains a star of our shotgun microphones, even though we have launched younger models long since,” concludes product manager Kai Lange. “It’s just great to have such a legend in the portfolio, a versatile, long-life, high-performance microphone. The MKH 416 is a mic where everything was perfect from the start.”

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## A short history of Sennheiser’s shotgun and RF condenser microphones

**Sennheiser shotgun and RF condenser microphones**

**1954**  
Sennheiser shows its first interference tube shotgun microphone for the TV and film industry, the MD 81, at a tradeshow.

**1961/1962**  
The birth of the MKH series: At the 1961 Hanover Industrial Fair, Sennheiser presents its first RF condenser microphones, the MK 102 and MK 103. A year later, the mics go into series production as the MKH 104 and MKH 105 for studio and reporting applications.

**1963**  
The MKH series is further improved and expanded with the cardioid MKH 404 and MKH 405. In all models, the sound inlet basket now has the shape of a crown.

**1964**  
The MKH RF condenser microphone technology is married with the interference tube principle, resulting in shotgun mics with extremely high directivity and low self-noise, the MKH 804 and MKH 805. TV studios and film workshops were thrilled – these mics could easily be kept out of the picture and still capture the audio.

**1956**  
The successor model, the MD 82 “tele-microphone”, results in a major breakthrough.

**1965**  
Sennheiser showcases two low-frequency MKH models, the MKH 110 and MKH 110-1. They were designed for frequency ranges between -35° C and +70° C, as they were employed for infra-sound location.





### Sennheiser shotgun and RF condenser microphones

**1970**  
The MKH 415 T (pictured below) introduces a totally new form factor for shotgun mics. The MKH 815 replaces the 805.

**1973**  
The MKH 435 T studio condenser mic replaces the MKH 405 T.

**1975**  
The MKH 416 P48 is Sennheiser's first shotgun mic for phantom power. It is accompanied by the MKH 406 P48 studio condenser mic and the MKH 816 P48 long shotgun model.

**1980s**  
SMD technology revolutionizes the manufacturing of electronic devices. Sennheiser is the first medium-sized company in Europe to convert all manufacturing processes and embrace the new technology.

**1985**  
A new MKH generation kicks off with the MKH 40. It incorporates SMD technology and the new push-pull transducer design. In the following years, Sennheiser adds the MKH 20 (1986), MKH 30 (1987), MKH 50 (1988), MKH 60, MKH 70 (both 1991), MKH 80 (1993) and the improved shotgun models MKH 416 and MKH 816.

**1987**  
The Academy of Motion Picture Arts and Sciences awards the MKH 816 their Scientific and Engineering Award for the film year 1986. Prof. Fritz Sennheiser accepts the award (pictured).

### Sennheiser shotgun and RF condenser microphones

**2000**  
The MKH 800 studio microphone replaces the MKH 80. Its wide frequency response of 30 to 50 kHz allows the sound engineer to fully exploit the possibilities offered by the new digital audio formats.

**2002**  
Sennheiser's first stereo shotgun microphone, the MKH 418 S, is launched.

**2007**  
Sennheiser launches the new, modular MKH 8000 microphone series, the first models being the omni MKH 8020, cardioid MKH 8040 and super-cardioid MKH 8050.

**2008**  
The MKH 800 TWIN dual capsule microphone opens up new dimensions for sound engineers: It provides both audio signals separately, allowing the mic's pick-up pattern to be adjusted remotely and infinitely at the mixing desk or during post-production.

**2011**  
The MKH 8060 short gun (pictured) and MKH 8070 long gun microphones are launched; followed by the MKH 8090 wide cardioid in 2012.

**2024**  
The long-awaited MKH 8030 adds a figure-of-eight characteristic to the MKH 8000 series family.

(Ends)

The high-resolution images accompanying this media release can be downloaded [here](#), the images of the timeline [here](#).

#### About the Sennheiser brand

We live and breathe audio. We are driven by the passion to create audio solutions that make a difference. Building the future of audio and bringing remarkable sound experiences to our customers – this is what the Sennheiser brand has represented for more than 75 years. While



professional audio solutions such as microphones, meeting solutions, streaming technologies and monitoring systems are part of the business of Sennheiser electronic SE & Co. KG, the business with consumer devices such as headphones, soundbars and speech-enhanced hearables is operated by Sonova Holding AG under the license of Sennheiser.

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