

FM & DAB+ transmitters of the SWR now in operation Acceptance measurement at the SWR location "Hochblauen"

by: Viktor Mann, KATHREIN Broadcast GmbH, Rohrdorf, 29th May 2020

KATHREIN has been known for decades for its antenna components of the highest quality. Broadcast antenna systems are often also set up as a turnkey solution (turnkey project). In addition to antenna products, KATHREIN also offers services such as antenna mounting hardware and installation.

The quality of the installation of the antenna system is at least as important as the quality of the products themselves to ensure safe and trouble-free operation over a long period. With transmitter powers of up to over 100 kW, even small errors could mean serious damage to the material.

The antennas of the Südwestrundfunk (SWR) at the "Hochblauen" location in the southern Black Forest were completely renewed or replaced in the last half of the year. A very special and tailor-made antenna system was used here for the first time, which made special planning by the KATHREIN engineers necessary. To save space, 3 vertically polarized DAB dipoles were nested in the horizontally polarized VHF system consisting of LogPer antennas. For this, numerous simulations and measurements were necessary in order to meet the specifications in the end.



Picture above:
SWR Transmitting Station "Hochblauen" in the Black Forest

Viktor Mann and Christian Sautter from Kathrein were on site recently to carry out the acceptance measurements and to hand over the antenna systems to the customer ready for operation.

The acceptance is carried out according to strict specifications, which are set out in the respective specifications of the broadcasting companies. First, the mechanical structure is checked and measured. At the same time, a visual check is carried out and the plug connections of antennas, distributors and cables are checked for tightness. Of course, the acceptance engineers first have to climb the transmission mast. Certainly, this is done under strict conditions and the staff is specially educated and trained for this. Working at dizzying heights is really not an enjoyment.

Left picture:
FM transmission antenna with integrated vertical DAB dipoles



After the mechanical check, the electrical measurements and a test operation are carried out. A key parameter here is the "VSWR matching" or "reflection factor". With proper planning and execution, this value must be greater than 20 dB for digital transmitters. Only 1% of the transmitting power may be reflected by the transmitting antenna to ensure trouble-free operation. A very tight value, but of course controllable at any time for the Kathrein engineers.

Finally, the "knock test" is carried out. The components of the antenna system are lightly pushed with a fist or a small rubber hammer. At the same time, a colleague in the transmitter room observes the measurement curve on the connected pulse reflectometer. If this remains stable, everything is fine. If there are jumps in the measurement curve in time with the knock, this usually indicates a loose connection. This must then e.g. be lifted by tightening. With the high transmitter powers that are common in broadcasting, poor connections could lead to fires in the system.



*Picture above:
Inside the transmission tower, the "knock test"*

Acceptance of the FM and DAB+ transmitting antennas on the "Hochblauen" went smoothly and the system was now ready for use by the customer.



*Left picture:
Christian Sautter and Viktor Mann (Kathrein)
have a good laugh. The acceptance was successful.*