



Antenna System AK451/AK471

Smallest log-periodic antennas for 5 to 30 MHz – safe shortwave links

- Frequency range 5 to 30 MHz
- Smallest log-periodic antennas in this frequency range
- Insensitive to wind gusts
- Large bandwidth and thus fast frequency change
- Elevated S/N ratio through directivity
- High link reliability
- Simple installation (for customer too)

AK451 and AK471 from Rohde & Schwarz are two compact shortwave antenna systems for output powers of up to 1 kW. As essential components for a safe, worldwide shortwave transmission 24 hours a day, AK451 and AK471 are ideal for use by embassies and radiomonitoring services.

The system consists of a mast, antenna rotator and the Log-periodic Antenna HL451 (5 to 30 MHz) or HL471 (7 to 30 MHz) as well as a number of accessories.

In comparison with former versions, **the antenna dimensions have been drastically reduced** so that mounting at sites with limited space, eg roofs, is also possible. This especially applies for HL471.

The optional Control Unit BG030 allows a fully computer-controlled use of the system in different communication networks and monitoring systems.



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In its minimum configuration, Antenna System AK451 essentially consists of Log-periodic HF Antenna HL451 which, in comparison to its predecessors, could be **reduced by almost 50% in its length and width**. To meet stringent space requirements, Antenna HL471 (Antenna System AK471) was developed for the frequency range 7 to 30 MHz. Compact size together with low weight make the HL471 ideal for roof mounting, for example.

Log-periodic Antennas HL451 and HL471 are guyed in a star-shaped set-up which yields **high resistance to wind** and **low susceptibility to vibration** and thus largely improved reliability.

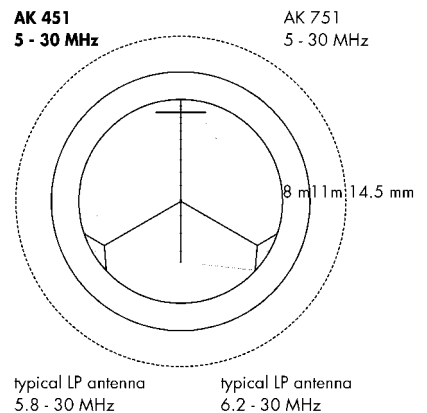
A large variety of accessories allows the implementation of different setups and thus customer-specific configurations of AK451 and AK471 (see system overview on page 5). In addition to guyed masts of different sizes for

ground and roof mounting, Antenna **Rotator** RD008 with its built-in RF rotary joint can be supplied, **requiring very little maintenance** and designed to **withstand extreme environmental stresses**.

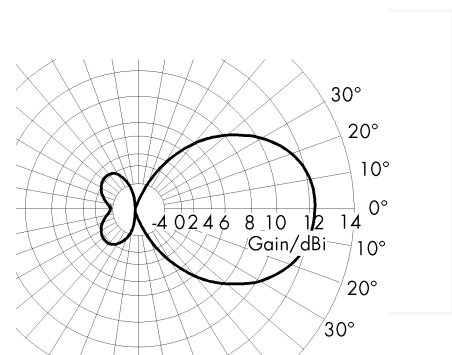
Control units available are RBO40 for manual control (ccw/cw rotation) and computer-controllable BG030 with optional interfaces for remote-control systems.

As no special tools are required, the customer can even carry out the installation himself. Rope lengths and pre-stress are predefined. The antenna is assembled simply using screw connections. Detailed installation instructions are part of the package supplied.

Antenna System AK451:
Rotatable Log-periodic Antenna HL451 (5 to 30 MHz), mounted on a 15-m mast; comparison with previous antennas (diagram on the right) confirms massive reduction of antenna size



Typical azimuth diagram



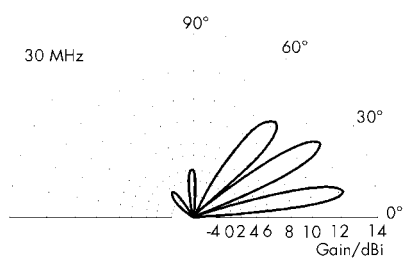
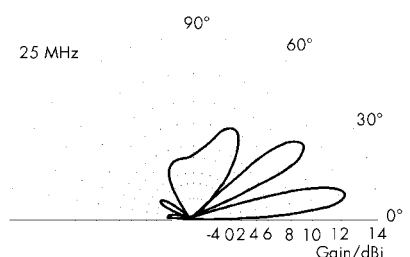
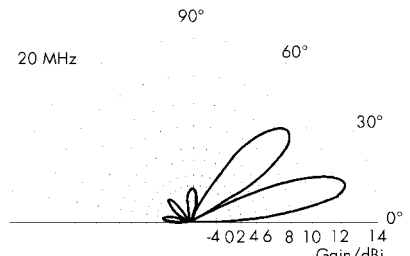
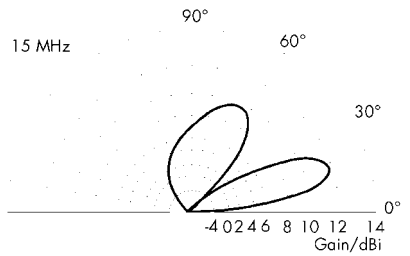
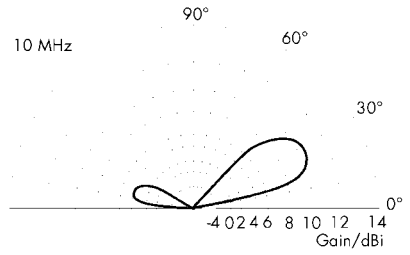
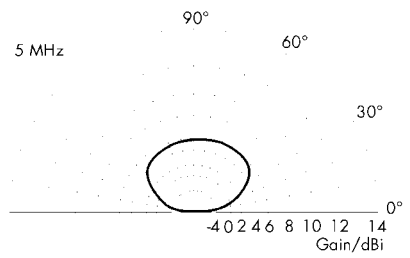
Specifications

Vertical patterns for Antenna HL451
with 15-m mast

Antennas	HL451	HL471
Frequency range Transmission Reception	5 to 30 MHz 2 to 30 MHz	7 to 30 MHz 5 to 30 MHz
Permissible transmit power	1 kW (rms)/ 2 kW (PEP)	
Polarization	linear horizontal	
Radiation patterns	see patterns on right	
Gain *)	6 to 12.5 dBi (15-m mast) 9 to 12.5 dBi (30-m mast) for 5 to 30 MHz	0 dBi at 7 MHz, increases to 6 dBi at 8 MHz, 6 to 12.5 dBi from 8 to 30 MHz (15-m mast)
VSWR*)	2	
Input impedance	50 Ω unbalanced	
RF connector	N male	
Dimensions Radius of rotation Length Width	8.3 m 15 m 16 m	5 m 8.8 m 11 m
Weight	260 kg	100 kg
Permissible wind speed (without ice accretion)	180 km/h for survival 156 km/h to DIN 4131	
MTBF	≥100 000 h	
Wind load at antenna flange at 156 km/h (without ice accretion) Vertical load Horizontal load Bending moment Torsional moment	2.6 kN 9.5 kN 4.8 kNm 1.8 kNm	1.0 kN 6.6 kN 1.5 kNm 1.6 kNm
Dimensions of antenna flange	pitch circle diameter 250 mm, 8 holes with 18 mm in diameter	
Transport weight	approx. 350 kg	approx. 180 kg
Volume	approx. 2.4 m ³	approx. 1.7 m ³
Dimensions	2 containers 130 cm x 90 cm x 70 cm 380 cm x 60 cm x 70 cm	1 container 380 cm x 65 cm x 45 cm

*) in flat terrain with low reflection and high soil conductivity

Control Units	RB040	BG030
Modes	manual at site, with switch for clockwise and counterclock- wise rotation and off position	computer-controllable, op- tional with interface for remote-control systems
Display	true value on analog 360° scale	nominal and true value on 3-digit LC display; true-angle input: synchro 115/90 V, 50 Hz
Display error	±2° x	±1°
Power supply	220 V +10/-15%, 47 to 63 Hz	
Temperature range Operation Storage	0 to 50 °C -20 to +70 °C	
Interfaces	-	option 1: IEC 625-1 option 2: serial interface to V.24, X.21, RS 485
Dimensions (W x H x D)	220 mm x 145 mm x 360 mm	220 mm x 132.5 mm x 392 mm
Weight	5.8 kg	6 kg



Rotator RD008	
Max. permissible vertical load at drive flange	3000 N
Max. permissible bending moment relative to flange surface	4250 Nm
Max. running torque	1300 Nm + 10%
Driving speed	0.5 rpm
AC supply	220 V \pm 5%/50 Hz/2.2 A
Weight	119 kg
Temperature range Operation Storage	-25 to +70 °C -40 to +70 °C
Colour	RAL 7000

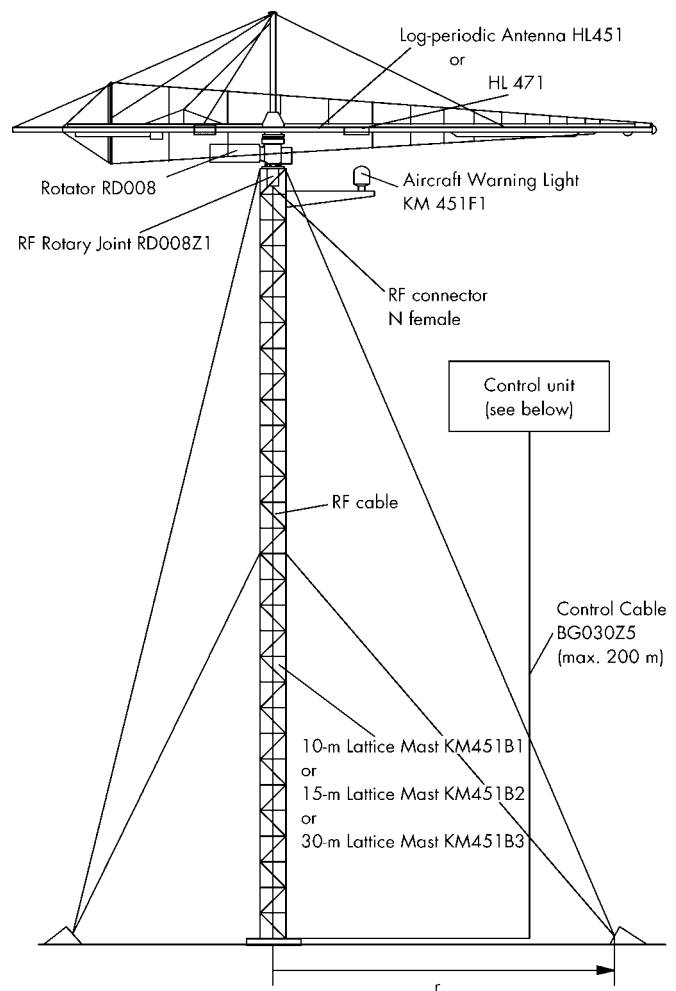
Ordering information

Antennas		Order No.
Log-periodic HF Antenna 5 to 30 MHz, 1 kW	HL451	733.8507.02
Log-periodic HF Antenna 7 to 30 MHz, 1 kW	HL471	755.3008.02

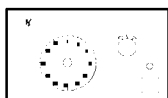
Additional accessories to form Antenna System AK451/AK471		
Rotator	RD008	720.6300.02
Mounting Kit to RD008 (RF rotary joint with fasteners)	RD008Z1	720.6400.02
Lattice Mast with guy ropes and mast climbing safety equipment Height 10 m Height 15 m Height 30 m	KM451 B1 KM451 B2 KM451 B3	4028.3351.02 4028.3400.02 4028.3451.02
Control Units for Rotator RD008	RB040 (manual control) BG030 (computer-controllable)	4003.2100.02 749.8501.02
Remote Control Unit for BG030	BG030A1	4000.0506.02
Interfaces to BG030 X.21/V.24/RS485 (serial) IEC/IEEE-bus Interface	BG030Z1 BG030Z2	749.8547.02 749.8582.02
X.21/V.24 Adapter Cable for Interface BG030Z1	BG030Z3	749.8624.02
19" Adapter Frame for BG030	BG030Z4	749.8660.02
Cable Set BG030/RB040 for Rotator RD008	BG030Z5	749.8701.99
Aircraft Warning Light for Masts KM451 B1 to 3	KM451 F1	4028.3500.02
RF cable 3/8" Flexwell		447.2010.00
RF connector (type N) for 3/8" cable		547.4313.00



Antenna System AK451/AK471 can be individually assembled according to customer requirements



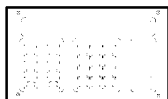
RD008



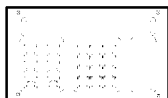
RB040



BG030



IEC/IEEE-bus Interface
BG030Z2



X.21 Interface
BG030Z1



X.21 Interface
BG030Z1

V.24 Adapter
BG030Z3

eg Siemens
2425B DX

eg Siemens
2425B DX

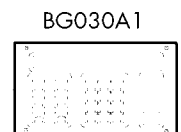


X.21 Interface
BG030Z1

Modem

Modem

X.21 Interface
BG030Z1



BG030A1

There are different control modes for Antenna System AK451/AK471: manual control (RB040, BG030) or computer-controlled via BG030 which can be optionally equipped with a suitable interface



ROHDE & SCHWARZ

ROHDE & SCHWARZ GmbH & Co. KG · Mühlendorfstraße 15 · D-81671 München
P.O.B. 801469 · D-81614 München · Telephone +4989 4129-0 · Fax +4989 4129-3567