

432 MHz Antenna Comparison Chart



Design Frequency
Wavelength

432 MHz
693,96 mm

#	Antenna Design	Length [mm]	Length [wl]	Gain-Th [dBi]	Gain [dBi]	Gain [dBd]	HPB-E [degs]	HPB-H [degs]	ST-E [mm]	ST-H [mm]	F/B(dB) [dB]	F/R [dB]	T-Loss [K]	T-Ant [K]	G/T [dB]	BC	EZ-Segs.	DE-dia [mm]	Ele-dia [mm]	Z [Ohms]	Remarks
1	DK7ZB 9 Ele	1480	2,13	13,72	14,09	11,95	36,00	39,40	1123	1029	25,54		2,6	47,9	-2,72		35	10	8	36,1	built by DF9CY
2	WA5VJB CheapYagi 12	1511	2,18	13,79	13,50	11,36	33,20	26,20	1215	1531	25,80		7,5	64,0	-4,46		19	3,18	3,18	13	
3	G0KSC 432 OWA 12	1620	2,33	14,02	14,41	12,27	35,00	38,20	1154	1060	21,84		0,8	41,9	-1,82		35	12,7	12,7	49	Tnx G0KSC
4	DK7ZB 10 Ele	1920	2,77	14,60	15,21	13,07	32,40	34,80	1244	1160	31,12		2,2	39,7	-0,78		35	12	8	25,6	built by DF9CY
5	YU7EF_7011	2110	3,04	14,92	15,24	13,10	33,60	36,20	1200	1117	19,52		3,5	29,4	0,56		35	10	6	50	
6	YU7EF_7013	2725	3,93	15,78	16,39	14,25	29,00	30,60	1386	1315	21,13		4,8	31,0	1,47		35	10	6	60	built by DF9CY
7	DL6WU 17el (Konni F20?)	3355	4,83	16,49	16,78	14,64	28,20	29,80	1424	1349	24,23		2,0	32,0	1,72		35	10	6	59	probably F20 antenna ! (DK1UV); 4R
8	YU7EF_7015	3392	4,89	16,53	17,14	15,00	27,20	28,60	1476	1405	21,24		5,1	28,3	2,63		35	10	6	58	
9	DL1RG_435_15	3400	4,90	16,53	17,26	15,12	25,80	26,80	1554	1497	28,67		2,4	34,9	1,83		25	12	10	25	tnx DL1RG; 435 MHz design, 0,07 dB less on 432
10	DK7ZB 16 Ele	3860	5,56	16,96	17,46	15,32	25,40	26,40	1578	1520	42,77		2,4	33,6	2,20		35	8	8	28	
11	K2RIW 19	3912	5,64	17,01	16,75	14,61	28,20	31,00	1424	1298	19,60		5,1	34,9	1,30	yes	29	4,75	4,75	40	tnx W4DEX (***)
12	RA3AQ 18 Element	3980	5,74	17,07	17,84	15,70	25,40	26,40	1578	1520	48,00		-0,1	24,5	3,95		31	4,5	4,5	54	tnx RA3AQ
13	DJ9BV 20 Ele	4176	6,02	17,23	17,75	15,61	23,60	24,60	1697	1629	18,08		6,1	36,1	2,17		35	8	5	54	
14	K1FO 22 Ele	4236	6,10	17,28	17,84	15,70	23,40	24,20	1711	1655	28,11		5,0	39,0	1,93		35	4,77	4,77	49	
15	G0KSC 432 LFA 18	4246	6,12	17,29	18,10	15,96	24,80	25,80	1616	1554	32,81		-6,7	15,9	6,29		9 / 11	12,7	6,35	50	tnx G0KSC; auto-seg; **)
16	YU7EF_7018	4373	6,30	17,39	17,94	15,80	25,20	26,20	1591	1531	21,50		4,8	27,2	3,60		35	10	6	56	
17	DL6WU 21el (DF9CY)	4464	6,43	17,46	18,06	15,92	23,80	24,60	1683	1629	20,88		1,8	31,5	3,08		35	10	10	55	used for EME DF9CY 1991 (ext. Konni F20); 4R
18	F9FT 432MHz21 DX N conn	4563	6,58	17,53	18,06	15,92	23,60	24,40	1697	1642	20,54		8,6	39,1	2,14	yes	35	4	4	15	tnx F6HLC
19	DK7ZB 19 Ele	4620	6,66	17,57	18,26	16,12	21,60	22,40	1852	1786	29,63		4,3	35,0	2,83		33 / 25	8	8	31	
20	N4GJV (DL9KR)	4775	6,88	17,68	18,11	15,97	23,20	24,20	1726	1655	19,63		3,4	38,4	2,27		33	6	4,5	55	8R
21	RA3AQ 21 Ele	4980	7,18	17,83	18,59	16,45	23,00	23,90	1740	1676	39,73		6,7	28,8	4,00		19	5	5	50	tnx RA3AQ
22	DK7ZB 21 Ele	5220	7,52	17,99	18,64	16,50	20,60	21,20	1941	1886	33,74		2,9	35,4	3,15		35	8	8	28	
23	YU7EF_7021	5303	7,64	18,04	18,73	16,59	23,20	24,00	1726	1669	29,06		4,7	25,5	4,66		35	10	6	55	
24	IOJXX 25JXX70	5488	7,91	18,16	18,77	16,63	23,10	24,00	1733	1669	27,33		0,1	20,9	5,49		35	5	5	28	from data sheet *5)
25	G0KSC 432 LFA 22	5517	7,95	18,17	19,26	17,12	21,80	22,40	1835	1786	44,80		-13,6	6,5	11,00		35	12,7	6,35	50	tnxG0KSC; D2 behaves crazy → segs 15; **)
26	DL6WU 25(28) Ele	5560	8,01	18,20	18,86	16,72	21,60	22,20	1852	1802	22,50		5,1	32,8	3,70		25	10	4	64	DF9CY (built by DF5LF); 4R
27	DK7ZB 23 el (6mm Dia)	5670	8,17	18,27	19,12	16,98	20,60	21,00	1941	1904	42,80		5,2	33,2	3,91		29	12	6	28	*4)
28	DJ9BV 26 Ele	5849	8,43	18,37	19,12	16,98	20,20	20,60	1979	1941	21,11		6,5	37,3	3,38		35	5	5	53	
29	DL9KR MK III 32 el	5903	8,51	18,40	19,05	16,91	21,40	22,00	1869	1818	26,30		4,2	32,2	3,97		35	6	2,5	48	Tnx DL9KR *)
30	RA3AQ 23F Ele	5980	8,62	18,45	19,40	17,26	20,60	21,20	1941	1886	30,60		8,6	31,5	4,42		35	5	5	50	tnx RA3AQ
31	M2 432 9wl (28el)	6374	9,18	18,66	19,46	17,32	19,60	20,20	2039	1979	23,50		0,2	32,6	4,32	yes	35	4,75	4,75	35	tnx for file !
32	CushCraft 729B	6680	9,63	18,82	19,51	17,37	19,20	19,80	2081	2018	27,51		-0,3	35,8	3,97	yes	35	12,7	4,75	54	tnx for file !; **)
33	YU7EF_7027	7240	10,43	19,09	19,56	17,42	21,20	21,80	1886	1835	26,70		5,8	25,8	5,44		19	8	6	47	

432 MHz Antenna Comparison Chart

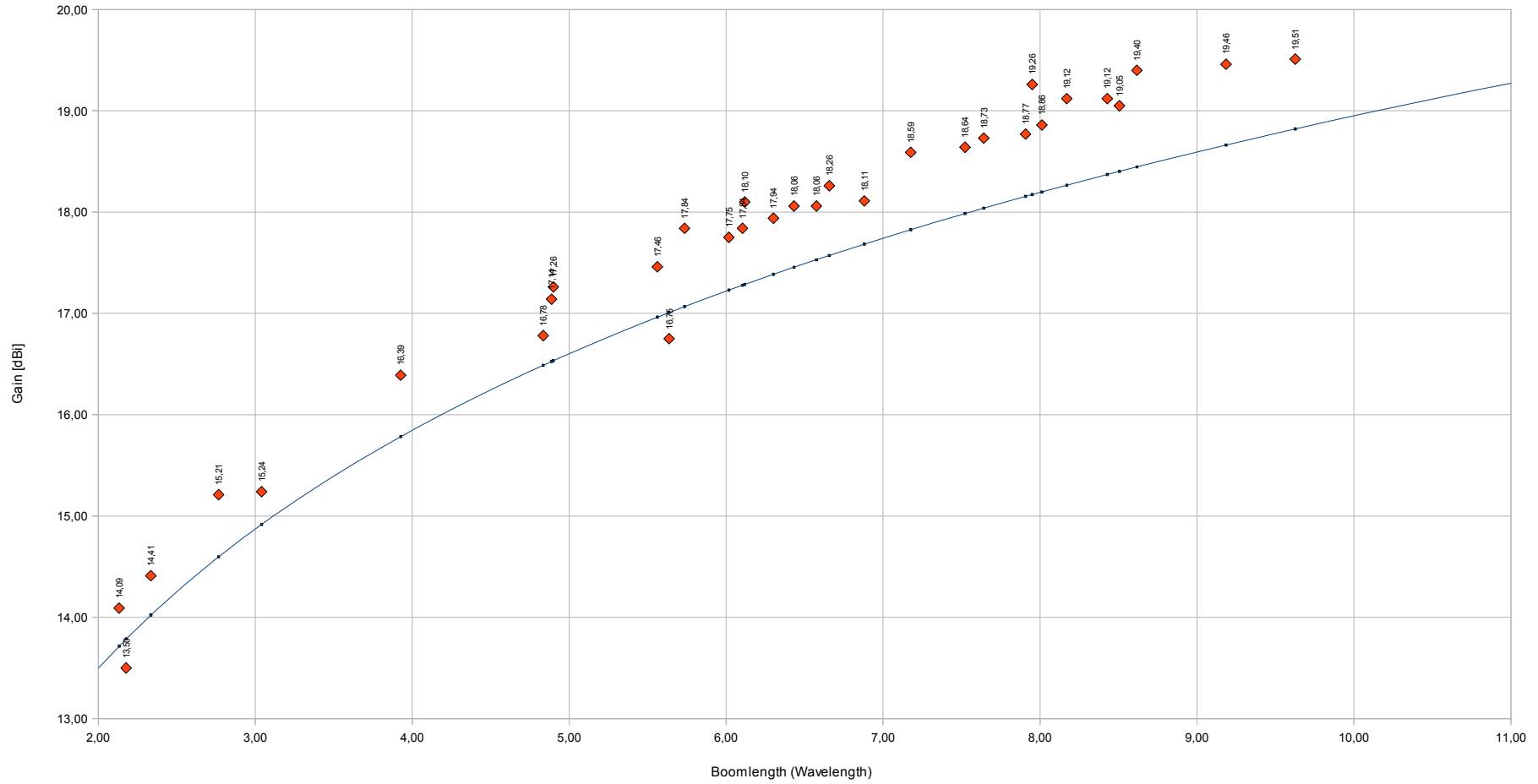


432 MHz Antenna Comparison Chart



Antenna Comparison 432 MHz

DF9CY



432 MHz Antenna Comparison Chart



Remarks:

- * Theoretical Antenna gain calculated from $7,8 * \log_{10}(\text{length} / \text{wavelength}) + 11,15 \text{ [dBi]}$ / see www.cebik.com and I. White G3SEK VHF/UHF Book
- * The antennas are calculated with EZNEC 5+ by R Lewallen
- * The calculations are valid for free space; No boom correction estimated unless marked. Real antennas suffer from losses by booms, masts etc.
- * Polarization is horizontal
- * Wire losses set to Aluminium
- * On-Sheet calculated values are **blue**
- * Two antennas are marked red, because of negative T-Loss values

Legend

Length in mm	
Gain-Th:	Theoretical antenna gain
F/B	Front / Back ratio in dB
EZ-Segs	Number of segments used in EZNEC 5+ calculations; Normally set to 35 unless problems occur – see remarks
DE Dia	Driven Element thickness in mm
Ele-dia	Element thickness
Z	Real value of impedance from EZNEC
SL-E, SL-H	Sidelobe at [degs=degrees] from main lobe
T-Ant	Antenna temperature; calculated with Tant.exe (YT1NT) at 30° elevation, Tsky= 15K , Tearth= 350K (for 432 MHz)
T-Loss	Overall antenna losses
BC	Boom correction estimated, as resonance too low. Correction done as described by W4RNL Cebik (ref. SM5BSZ, DL6WU)
4R, 8R	4, 8 Elements Reflector (counted as 1 element in antenna description)
HPB-E, HPB-H	Half-Power-BeamWidth (-3dB) E-, H-plane in degrees
ST-E, ST-H	Stacking Distance according DL6WU : $\text{Dopt} = \text{wavelength} / (2 * \sin(\text{phi} / 2))$; $\text{phi} = \text{PI}() / (180 / \text{HPB})$

- *) not easy to simulate with EZNEC 5+, as different materials are used in the design.
- **) **What do negative values of T-loss mean ??**
- ***) Strange behaviour of the K2RIW_19 antenna; boom correction did not really help. Data taken from manual.
- *4) Calculated with 6mm elements. The 10mm version has a sort of a problem.
- *5) The "physical" antenna has boom correction; the driven element is 8mm longer than expected, causing resonance to be too low.

Comments are very welcome to df9cy@web.de

If you have **built** an antenna you would like to see in here, please send the dimensions, or even better the EZNEC file.

Antennas wanted: Konni Antennen F20, M2 antennas, CC antennas, KLM antennas

432 MHz Antenna Comparison Chart



Other antenna comparison charts and listings

If you want to build your own antenna, here are some VERY good designs to start with !

<i>YU7XL Oblong 432 MHz antennas</i>	www.qslnet.de/member/yu7xl/oblong_models_432.htm
<i>DK7ZB 432 MHz antennas</i>	www.mydarc.de/dk7zb/start1.htm
<i>YU7EF antennas</i>	www.yu7ef.com/LowTemperatureAnt.htm
<i>G0KSC</i>	www.g0ksc.co.uk/

Antennas Theory and more

<i>W4RNL L.B.Cebik (SK)</i>	www.cebik.com	You have to register for free
<i>GM3SEK Dr. Ian White</i>	http://www.ifwtech.co.uk/g3sek/diy-yagi/index.htm	

Additional Information

I was looking for a design for 432 MHz EME. So I wanted to compare a number of antennas "on the same level". This was my intention for setting up this file.

I have seen, that my results are very close to those fellow hams did simulate on some of the above antennas. So I think my antenna values are not completely wrong.

The resonance from the EME community is high, and so I am willing to add antennas – but not all numerous designs available. If you have a working design – your own or from the web or commercial, I can put it into this list.

This file is made with OpenOffice 3.2 Calc

History

1. April 2010	Initial File Setup
6. April 2010	added M2 9wl; YU7EF_7021 – deleted DK7ZB 12 ele; DL6WU 24 ele
7. April 2010	added F9FT 432MHz 21el N; G0KSC 432LFA22 – LFA18 – OWA12
15. April 2010	added WA5VJB CheapYagi 12; RA3AQ_21 and _23; DL9KR Mk3;CC729B
4. May 2010	added DL1RG_15;
10. May 2010	added K2RIW_19; DK7ZB_23; YU7EF_7027
08.June 2010	minor corrections
08.Sept 2010	added RA3AQ_18; minor corrections