

Old Reference: Tsky=20K Tearth=350K  
 New Reference: Tsky=27K

Reference: Estimated Values for man made noise (Tearth) on 432 MHz:

Rural = 760 K  
 Residential = 1800 K  
 City = 8200 K

Man-Made Noise in Our Living Environments  
 U.R.S.I. Radio Science Bulletins No. 334, 09.2010

Enter Tsky > 27 K      Enter T\_earth, K > 1800 K

TYPE OF ANTENNA	DL6WU Optimal Stacking				1 Ant.											Convergence Correction req.
	1 Ant.				4 Antennas				H Plane			Z (ohms)	VSWR Bandwidth	Feed System		
	L λ	GAIN (dBi)	E (M)	H (M)	Ga (dBi)	Tlos (K)	Ta (K)	Ant G/T (dB)	F/R (dB)	1st SL (dB)	2nd SL (dB)					
KF2YN Boxkite 4	0.44	13.24	1.20	0.85	19.30	4.93	183.91	-3.35	26.1	21.5	none	52.5	1.10:1	Bent Dipole	Yes	
KF2YN Boxkite 7	1.34	15.64	1.40	1.17	21.56	8.14	114.17	0.98	27.6	27.5	21.3	51.7	1.05:1	Bent Dipole	Yes	
DG7YBN GTV70-8n	1.84	13.60	1.07	0.93	19.56	4.90	124.39	-1.39	24.8	16.5	21.7	49.8	1.83:1	Bent Dipole	Yes	
KF2YN Boxkite 10	2.37	16.55	1.50	1.30	22.46	8.73	90.67	2.89	28.3	19.2	28.0	48.7	1.08:1	Bent Dipole	Yes	
InnoV 10 LFA	2.43	14.43	1.12	1.03	20.36	3.67	100.00	0.36	23.8	17.2	23.3	50.7	1.13:1	LFA-LOOP	Yes	
InnoV 10 LFA 2018	2.47	14.35	1.11	1.01	20.27	3.65	96.27	0.44	22.1	18.6	21.4	48.8	1.25:1	LFA-LOOP	Yes	
YU7EF EF7010-5	2.59	14.64	1.14	1.05	20.56	5.00	98.21	0.64	22.5	16.9	24.1	50.0	1.06:1	Dipole	No	
+DG7YBN GTV 70-11w	2.81	14.97	1.18	1.09	20.90	2.70	84.82	1.62	27.8	15.9	23.4	50.0	1.06:1	Bent Dipole	No	
YU7EF EF7011B-5	2.87	15.07	1.20	1.11	21.00	4.70	94.56	1.24	25.4	16.9	20.1	49.0	1.56:1	Dipole	No	
Innov 11 LFA	2.87	15.05	1.20	1.10	20.98	3.95	84.86	1.69	25.6	16.4	23.8	50.4	1.07:1	LFA-LOOP	Yes	
*Innov 11 LFA	2.87	15.05	1.19	1.10	20.96	3.95	84.32	1.70	25.6	16.4	23.8	50.4	1.07:1	LFA-LOOP	Yes	
EAntenna 432LFA11	2.94	15.09	1.20	1.11	21.02	3.93	86.93	1.63	25.4	17.0	24.9	47.9	1.28:1	LFA-LOOP	Yes	
*KF2YN Polly 12 CR	3.17	15.70	1.30	1.30	21.74	3.19	80.00	2.71	25.4	16.1	22.1	48.3	1.17:1	Multi-Pol loop	No	
+*InnoV 12Y	3.27	15.59	1.26	1.17	21.52	3.11	76.72	2.67	27.6	15.9	21.8	49.7	1.43:1	LFA-Loop	Yes	
+InnoV 12Y	3.27	15.59	1.27	1.19	21.54	3.39	78.02	2.62	27.6	15.9	21.8	49.7	1.43:1	LFA-Loop	Yes	
InnoV 12 LFA	3.29	15.48	1.24	1.16	21.40	3.95	71.05	2.88	28.3	16.8	23.3	50.1	1.07:1	LFA-LOOP	Yes	
*InnoV 12 LFA	3.29	15.48	1.23	1.15	21.37	4.00	69.83	2.93	28.3	16.8	23.3	50.1	1.07:1	LFA-LOOP	Yes	
YU7EF EF7012B-5	3.30	15.58	1.26	1.17	21.50	4.90	78.72	2.54	24.0	17.6	21.3	48.6	1.40:1	Dipole	No	
EAntenna 432LFA12	3.31	15.32	1.23	1.14	21.24	4.32	80.43	2.19	28.6	16.1	24.5	50.1	1.45:1	LFA-LOOP	Yes	
InnoV 12 LFA-430	3.32	15.59	1.27	1.19	21.54	3.11	77.80	2.63	26.4	15.5	21.7	49.9	1.39:1	LFA-LOOP	Yes	
KF2YN Boxkite 13	3.37	17.38	1.63	1.50	23.30	9.28	95.37	3.51	28.0	18.0	29.0	50.9	1.09:1	Bent Dipole	Yes	
Innov 13 LFA	3.72	15.92	1.31	1.23	21.85	4.50	67.36	3.57	29.5	16.5	23.2	50.1	1.15:1	LFA-LOOP	Yes	
*InnoV 13 LFA	3.72	15.92	1.30	1.22	21.83	4.50	66.82	3.58	29.5	16.5	23.2	50.1	1.15:1	LFA-LOOP	Yes	
YU7EF EF7013M-6	3.83	16.11	1.33	1.25	22.01	4.70	77.37	3.12	26.4	18.7	21.8	49.4	1.06:1	Dipole	No	
M2 432-12EME	3.98	16.22	1.39	1.32	22.11	3.92	121.41	1.27	19.7	12.3	16.0	200.4	1.49:1	Folded Dipole	Yes	
*M2 432-12EME	3.98	16.22	1.42	1.37	22.17	3.92	123.56	1.25	19.7	12.3	16.0	200.4	1.49:1	Folded Dipole	Yes	
F9FT 19	4.02	15.96	1.33	1.26	21.88	6.07	105.05	1.67	21.5	14.1	17.5	55.7	1.14:1	Folded Dipole	Yes	
DG7YBN Tonna 19 mod	4.02	16.17	1.35	1.27	22.07	6.07	75.13	3.31	22.4	14.3	18.7	44.7	1.15:1	Folded Dipole	Yes	
InnoV 14 LFA	4.03	16.46	1.38	1.32	22.31	4.50	66.77	4.06	30.8	16.0	22.3	52.6	1.14:1	LFA-LOOP	Yes	
*InnoV 14 LFA	4.03	16.46	1.36	1.29	22.26	4.50	65.75	4.08	30.6	16.0	22.3	52.6	1.14:1	LFA-LOOP	Yes	
+DG7YBN GTV70-14	4.06	16.38	1.38	1.31	22.31	3.80	74.50	3.59	26.9	15.9	20.6	49.4	1.51:1	Bent Dipole	No	
YU7EF EF7014M-6	4.24	16.50	1.39	1.32	22.39	4.50	80.31	3.34	23.8	17.9	20.5	49.5	1.11:1	Dipole	No	
RA3AQ AQ70-14f	4.30	16.65	1.41	1.34	22.54	6.94	72.26	3.95	26.1	15.9	20.0	53.3	1.09:1	Folded Dipole	Yes	
KF2YN Boxkite 16	4.37	18.02	1.74	1.61	23.85	10.17	100.88	3.81	27.4	17.0	25.0	49.1	1.06:1	Bent Dipole	Yes	
*KF2YN Polly 15 CR	4.44	16.76	1.40	1.40	22.66	3.50	67.64	4.36	26.7	16.3	20.3	47.4	1.21:1	Multi-pol loop	No	
IOJXX 16JXX70 old ver	4.46	16.53	1.41	1.33	22.44	4.86	80.33	3.39	23.4	16.6	21.3	201.8	1.05:1	T Match	Yes	
IOJXX 32JXX70 XPOL H new ver	4.46	16.28	1.37	1.37	22.17	5.94	121.25	1.33	18.6	15.0	18.0	206.6	1.03:1	T Match	Yes	
IOJXX 32JXX70 XPOL V new ver	4.46	16.28	1.37	1.37	22.18	4.38	123.34	1.27	18.6	15.0	18.0	206.6	1.03:1	T Match	Yes	
EAntenna 432LFA15	4.58	15.66	1.22	1.14	21.36	4.03	56.28	3.86	29.2	26.2	29.1	48.4	1.25:1	LFA-LOOP	Yes	
InnoV 15 LFA	4.59	16.68	1.42	1.34	22.57	4.77	61.24	4.70	31.1	15.8	22.1	51.1	1.08:1	LFA-LOOP	Yes	
YU7EF EF7015M-5	4.69	16.80	1.43	1.36	22.66	5.40	78.36	3.72	24.3	19.0	21.1	49.5	1.03:1	Dipole	No	
Konni F20	4.77	16.69	1.44	1.36	22.61	1.74	82.03	3.47	21.9	14.0	16.4	210.7	1.06:1	Folded Dipole	Yes	
WiMo 15 (YU7EF)	4.89	17.06	1.46	1.30	22.87	4.30	63.37	4.85	22.3	17.2	20.8	174.5	3.05:1	Folded Dipole	Yes	
InnoV 16 LFA	5.19	17.27	1.50	1.43	23.15	4.77	59.68	5.39	29.3	18.1	23.3	48.4	1.19:1	LFA-LOOP	Yes	
+DG7YBN GTV70-17w	5.23	17.29	1.51	1.44	23.20	3.00	65.34	5.05	31.5	14.7	20.8	49.9	1.03:1	Bent Dipole	No	
InnoV 17 LFA	5.33	17.25	1.49	1.42	23.11	4.28	61.31	5.24	27.4	18.1	23.5	49.9	1.03:1	LFA-LOOP	Yes	
*InnoV 17 LFA	5.33	17.25	1.45	1.45	23.11	4.28	60.77	5.27	27.4	18.1	23.5	49.9	1.03:1	LFA-LOOP	Yes	
YU7EF EF7017M-5	5.56	17.41	1.52	1.44	23.22	5.60	76.50	4.38	25.0	18.5	22.3	50.7	1.06:1	Dipole	No	
*KF2YN Polly 18 CR	5.69	17.79	1.95	1.95	23.96	3.70	73.29	5.31	28.3	14.8	20.0	48.1	1.18:1	Multi-Pol loop	No	
RA3AQ AQ70-18f	5.74	17.76	1.59	1.53	23.64	6.08	70.36	5.17	27.2	16.1	20.5	51.7	1.08:1	Folded Dipole	Yes	
YU7EF EF7017XM-5	5.74	17.61	1.55	1.49	23.45	6.36	67.21	5.18	27.5	21.6	24.0	52.2	1.19:1	Dipole	Yes	
InnoV 18 LFA	5.76	17.49	1.52	1.45	23.33	4.28	57.60	5.73	28.2	18.5	24.8	49.8	1.05:1	LFA-LOOP	Yes	
+DG7YBN GTV70-19	5.93	17.80	1.60	1.54	23.68	3.60	63.48	5.65	29.6	15.4	20.2	49.3	1.28:1	Bent Dipole	No	
+Konni F20 Mod YBN	5.94	17.57	1.58	1.50	23.42	1.74	85.23	4.11	24.7	14.3	16.1	223.4	1.13:1	Folded Dipole	Yes	

YU7EF EF7018M-5	6.00	17.58	1.53	1.46	23.33	5.50	68.86	4.95	26.5	17.5	22.4	49.2	1.06:1	Dipole	No
K1FO 22	6.10	17.85	1.63	1.56	23.75	4.75	80.77	4.68	20.6	15.4	21.2	200.8	1.34:1	T Match	Yes
*InnoV 18 LFA 2019	6.12	17.84	1.56	1.53	23.71	5.08	54.69	6.33	30.7	16.5	28.5	48.2	1.17:1	LFA-LOOP	Yes
EAntenna 432LFA18	6.13	17.88	1.61	1.55	23.76	5.60	56.78	6.22	30.4	16.0	26.2	47.6	1.42:1	LFA-LOOP	Yes
YU7EF EF7019B-5	6.43	17.91	1.60	1.54	23.72	5.70	72.34	5.13	25.7	17.8	23.4	50.5	1.12:1	Dipole	No
KF2YN Polly 20 CR	6.50	18.30	1.90	1.90	24.43	3.80	71.28	5.90	28.7	14.4	19.5	48.8	1.21:1	Multi-Pol loop	No
InnoV 19 LFA	6.54	18.18	1.68	1.63	24.10	5.02	56.17	6.61	34.3	15.0	20.1	47.6	1.09:1	LFA-LOOP	Yes
InnoV 19 LFA 2019	6.57	18.12	1.71	1.65	24.05	7.02	59.91	6.27	27.0	15.2	30.0	50.1	3.57:1	LFA-LOOP	Yes
Tonna 21 DX	6.61	17.91	1.67	1.61	23.80	6.65	115.03	3.19	20.5	14.5	18.2	58.4	2.32:1	Folded Dipole	Yes
KF2YN Boxkite 22	6.70	19.26	1.99	1.90	25.14	10.75	93.19	5.45	29.0	16.2	21.2	52.1	1.17:1	Bent Dipole	Yes
InnoV 20 LFA	6.99	18.28	1.73	1.67	24.31	5.02	50.36	7.29	35.2	15.1	20.7	50.5	1.09:1	LFA-LOOP	Yes
InnoV 20 LFA 2019	7.00	18.44	1.76	1.70	24.38	5.86	49.41	7.44	30.0	14.7	22.4	48.0	1.53:1	LFA-LOOP	Yes
+YU7XL QY721104D14	7.04	18.42	1.88	1.82	24.47	3.40	51.92	7.32	27.7	18.5	22.8	201.1	1.28:1	LFA 200 Ω	Yes
RA3AQ AQ70-21f	7.14	18.54	1.73	1.67	24.41	6.94	58.07	6.77	27.9	16.8	21.3	52.3	1.07:1	Folded Dipole	Yes
BVO70-7.2 WL modified	7.16	18.49	1.76	1.70	24.42	3.80	80.95	5.34	22.6	14.9	19.1	49.5	1.06:1	Dipole	No
Directive DSEFO432-25	7.39	18.57	1.74	1.69	24.47	5.09	65.78	6.29	25.4	15.9	20.5	198.2	1.38:1	T Match	Yes
*Directive DSEFO432-25	7.39	18.57	1.78	1.68	24.47	4.90	65.56	6.30	25.4	15.9	20.5	198.2	1.38:1	T Match	Yes
Directive DSEFO432-25XPOL H	7.39	18.57	1.73	1.73	24.48	5.11	65.27	6.33	25.4	15.9	20.5	198.2	1.38:1	T Match	Yes
Directive DSEFO432-25XPOL V	7.39	18.57	1.73	1.73	24.48	5.40	65.03	6.35	25.4	15.9	20.5	198.2	1.38:1	T Match	Yes
InnoV 22 LFA 2019-2	7.47	18.84	1.82	1.76	24.74	6.69	45.51	8.16	31.2	14.0	28.0	46.2	2.67:1	LFA Loop	Yes
InnoV 21 LFA 2019	7.51	18.53	1.82	1.76	24.58	6.430	48.465	7.73	28.2	14.1	26.4	47.9	1.53:1	LFA Loop	Yes
+DG7YBN GTV70-23	7.55	18.65	1.76	1.70	24.51	3.800	53.546	7.22	32.3	15.7	21.8	48.4	1.56:1	Bent Dipole	Yes
YU7EF EF7021B-5	7.59	18.66	1.74	1.68	24.50	7.800	61.978	6.58	29.6	20.3	21.7	50.2	1.33:1	Dipole	No
IOJXX 25JXX70	7.91	18.53	1.74	1.68	24.41	5.610	72.534	5.80	23.9	21.3	24.8	198.6	1.12:1	T Match	Yes
InnoV 22 LFA 2019	7.95	18.84	1.85	1.80	24.77	6.760	44.433	8.29	32.0	13.9	28.5	46.2	2.66:1	LFA Loop	Yes
KF2YN Polly 24 CR	8.15	19.15	1.90	1.90	25.11	3.700	71.138	6.59	29.5	13.1	19.1	51.8	1.14:1	Multi-Pol loop	No
*Antennas-Amplifiers PA432-23-6A	8.21	18.88	1.90	1.90	24.90	6.700	47.461	8.14	36.3	17.0	26.9	49.1	1.09:1	Hair Pin	Yes
+YU7XL QY724104D17	8.35	19.01	2.00	1.90	24.99	3.400	51.384	7.88	31.7	18.7	22.8	199.0	1.23:1	LFA 200 Ω	Yes
+DG7YBN GTV70-25	8.39	18.97	1.80	1.74	24.84	3.200	48.423	7.99	32.6	16.3	22.1	41.2	1.25:1	Bent Dipole	No
InnoV 23 LFA	8.40	19.16	1.87	1.82	25.08	5.590	48.328	8.24	31.8	15.9	21.7	45.2	1.23:1	LFA-LOOP	Yes
*InnoV 23 LFA	8.40	19.16	1.89	1.85	25.06	5.590	48.328	8.22	31.8	15.9	21.7	45.2	1.23:1	LFA-LOOP	Yes
DJ9BV BVO70-8.5wl	8.43	19.14	1.95	1.90	25.13	5.000	98.744	5.18	24.3	14.9	17.8	203.9	1.45:1	Folded Dipole	Yes
InnoV 23 LFA 2019	8.43	19.02	1.87	1.82	24.94	6.400	43.586	8.55	32.2	14.4	27.6	47.4	1.32:1	LFA-LOOP	Yes
DJ9BV OPT70-8.5wl	8.44	19.04	1.80	1.75	24.87	4.880	81.973	5.73	23.2	15.8	20.1	186.1	1.56:1	Folded Dipole	Yes
EAntenna 432LFA23	8.44	18.96	1.90	1.84	24.89	8.050	46.663	8.20	32.0	14.2	30.9	47.8	3.99:1	LFA-LOOP	Yes
YU7EF EF7023B-5	8.47	18.98	1.79	1.73	24.78	6.390	55.982	7.30	30.5	19.6	21.9	48.6	1.21:1	Dipole	No
RA3AQ AQ70-24f	8.52	19.22	1.87	1.82	24.82	6.070	50.898	7.75	30.0	15.1	21.0	52.0	1.13:1	Folded Dipole	Yes
InnoV 24 LFA	8.89	19.32	1.92	1.87	25.25	5.870	46.473	8.58	33.4	15.3	22.1	46.4	1.19:1	LFA-LOOP	Yes
*InnoV 24 LFA	8.89	19.32	1.89	1.84	25.22	5.870	45.936	8.60	33.4	15.3	22.1	46.4	1.19:1	LFA-LOOP	Yes
YU7EF EF7024B-5	8.90	19.19	1.84	1.79	25.02	7.500	58.309	7.36	30.3	20.5	22.4	50.1	1.60:1	Dipole	No
InnoV 24 LFA 2019-b	8.94	19.20	1.89	1.83	25.11	6.160	43.668	8.71	33.2	30.6	29.4	50.1	1.60:1	LFA-LOOP	Yes
M2 432-9WLA	9.19	19.40	2.02	1.96	25.33	7.220	119.681	4.55	23.2	15.8	18.1	167.2	2.09:1	Folded Dipole	Yes
*M2 432-9WLA	9.19	19.40	1.83	1.88	25.23	6.980	102.726	5.11	23.2	15.8	18.1	167.2	2.09:1	Folded Dipole	Yes
+YU7XL QY728107D21	10.01	19.64	2.22	2.06	25.65	3.400	51.921	8.50	28.6	19.1	24.1	198.1	1.29:1	LFA 200	Yes
Antennas-Amplifiers PA432-26-7BGP	10.03	19.60	1.95	1.95	25.49	7.365	45.010	8.96	36.3	16.2	28.2	47.9	1.07:1	HairPin	No
YU7EF EF7027B-5	10.18	19.67	1.94	1.89	25.47	7.800	61.440	7.59	25.6	20.0	23.2	50.3	1.64:1	Dipole	No
Hy-Gain UB-7031DX	10.42	19.54	1.92	1.86	25.33	5.240	76.411	6.50	26.2	18.3	21.1	199.5	1.26:1	T Match	Yes
WiMo 27 (YU7EF)	10.43	19.43	1.85	1.80	25.08	4.300	49.674	8.12	27.1	20.5	22.6	191.8	2.72:1	Folded Dipole	Yes
+DG7YBN GTV70-30	10.49	19.74	1.94	1.89	25.58	3.900	43.477	9.20	32.9	18.9	26.0	42.5	1.28:1	Bent Dipole	No
K1FO 33	10.61	20.03	2.08	2.04	25.95	6.130	65.706	7.77	22.0	15.5	22.2	200.5	1.19:1	T Match	Yes
Directive DSEFO432-33	10.61	20.03	2.08	2.04	25.95	6.130	65.706	7.77	22.0	15.5	22.2	200.5	1.19:1	T Match	Yes
RA3AQ AQ70-30f	11.39	20.33	2.08	2.04	26.08	5.530	46.147	9.44	30.6	16.8	22.1	51.6	1.10:1	Folded Dipole	Yes
InnoV 30 LFA	11.64	20.45	2.27	2.22	26.42	6.670	57.249	8.84	36.6	13.9	20.3	49.6	2.38:1	LFA-LOOP	Yes
*YU7EF EF7032-5	12.49	19.97	1.94	1.90	25.58	6.641	52.167	8.41	27.7	23.1	24.2	51.3	3.44:1	Dipole	No
InnoV 33 LFA	13.03	20.85	2.32	2.29	26.81	5.330	52.792	9.58	36.6	13.3	19.2	50.1	1.17:1	LFA-LOOP	Yes
DJ9BV OPT70-13wl	13.29	20.85	2.35	2.29	26.80	5.150	78.486	7.85	25.9	14.8	19.7	183.0	1.44:1	Folded Dipole	Yes
M2 432-13WLA	13.29	20.81	2.32	2.28	26.69	7.160	117.014	6.01	22.4	19.2	20.9	199.9	2.35:1	Folded Dipole	Yes
*M2 432-13WLA	13.29	20.81	2.08	2.08	26.40	7.770	126.405	5.38	22.4	19.2	20.9	199.9	2.35:1	Folded Dipole	Yes
IOJXX 39JXX70	13.53	20.16	2.00	1.97	25.86	6.300	60.096	8.07	26.1	26.7	27.0	194.0	1.19:1	T Match	Yes
InnoV 34 A LFA 2019	13.48	20.98	2.40	2.38	26.95	6.440	53.315	9.68	37.8	12.9	18.0	50.1	1.63:1	LFA-LOOP	Yes
InnoV 34 LFA B 2019	13.54	20.89	2.40	2.38	26.89	7.190	54.305	9.54	37.3	12.7	17.9	50.1	2.04:1	LFA-LOOP	Yes
*InnoV 34 LFA B 2019	13.54	20.89	2.20	2.20	26.72	6.910	48.091	9.90	37.3	12.7	17.9	50.1	2.04:1	LFA-LOOP	Yes
InnoV 35 LFA 2019	13.94	20.95	2.46	2.43	26.93	7.460	58.625	9.25	36.7	12.7	18.1	49.1	2.69:1	LFA-LOOP	Yes
InnoV 38 LFA	15.41	21.45	2.30	2.35	27.23	6.890	47.041	10.51	36.9	12.7	17.0	49.3	1.87:1	LFA-LOOP	Yes
*InnoV 38 LFA	15.41	21.45	2.59	2.56	27.26	6.330	45.902	10.64	36.9	12.7	17.0	49.3	1.87:1	LFA-LOOP	Yes

InnoV 39 LFA 2019	15.79	21.59	2.52	2.49	27.54	6.150	46.340	10.88	39.5	12.9	18.9	49.2	1.15:1	LFA-LOOP	Yes
InnoV 40 LFA 2019	16.25	21.82	2.59	2.56	27.63	7.000	45.697	11.03	35.6	12.7	19.2	51.8	1.55:1	LFA-LOOP	Yes
							0.000								

**Only Antennas that have actually been built are posted in these Tables**

**Thanks to Vladimir, UR5EAZ for establishing the Interactive Mode in the 144 and 432 Tables**

**Thanks to Hartmut, DG7YBN for his ongoing support and many inputs to the Tables**

Legend:

1. L = Length in Wavelengths
2. Gain = Gain in **dBi** of a single antenna
3. E = E plane (Horizontal) stacking in Meters.
4. H = H plane (Vertical) stacking in Meters.
5. Ga = Gain in **dBi** of a 4 bay array
6. Tlos = The internal resistance of the antenna in degrees Kelvin.
7. Ta = The total temperature of the antenna or array in degrees Kelvin. This includes all the side lobes, rear lobes and internal resistance of the antenna or array.
8. F/R = Front to Rear in dB over the rear 180 degrees of an antenna using either E or H plane.
9. Z ohms = The natural impedance of a single antenna in free space.
10. VSWR = VSWR Bandwidth is based a single antenna over 432.000 - 435.000 MHz with a reference at 432.300 MHz. This parameter gives an indicator of the antenna "Q" and what to expect with with stacking and wet weather.
11. Ant G/T = Figure of merit used to determine the receive capability of the antenna or array. Ant G/T (dB) = Ga - 10\*log(Ta). The more positive figure the better. Ant G/T is modelled in Tant.exe at 30 degrees elevation.

Notes:

1. The programs used to calculate E/H Stacking,G,Ta,Tlos and G/T are EZNEC 5+ by Roy Lewallen W7EL,4NEC2 by Arie Voors and Tant.exe by Sinisa, YT1NT/VE3EA or AGTC\_lite by F5FOD/DG7YBN This combination of software provides excellent accuracy. Segment Density is 25 segments per half wave.
2. Temperatures initially used: Tsky=20 degrees;Tearth=350 degrees  
Temperatures now adjustable to Tsky=27 Kelvin. Tearth: Rural = 460K Kelvin, Residential = 1800K Kelvin, City = 7900 Kelvin
3. Dipole Z is measured at 432.1 MHz
4. F/R, 1st and 2nd Side Lobes (SL) have been calculated on a single antenna
5. No stacking harness losses or H frame effects are included in the 4 bay gain figures.
6. All stacking dimensions EXCEPT those marked with a "\*" and "#" are calculated from the DL6WU stacking formula:  

$$D = W / (2 * \sin(B/2))$$
Where:  
D = stacking distance,vertical or horizontal  
W = wavelength, in the same units as D  
B - beamwidth between -3dB points.  
Use vertical beamwidth for vertical stacking (as above),  
Use horizontal beamwidth for horizontal stacking.

7. Antennas marked with a "\*" have stacking dimensions recommended by the manufacturer or designer.
8. Antennas marked with a "#" have stacking dimensions for XPOL antennas by VE7BQH.
9. Antennas marked with a "+" have some or all elements over 6mm. All others are 4MM to 6MM.
10. FD = Folded Dipole
11. Convergence Correction: NEC2 and NEC 4 are incapable of handling complex feed systems accurately like Folded Dipoles, T Matches, LFAs etc. Convergence Correction using the KF2YN Excel program is required. See DUBUS 4/2010 "The Correction of Convergence Errors in Antenna Temperature Calculations by Brian Cake, KF2YN for details.
12. Manufacturer/Designer Legend: Single click on Sites in blue

[Antennas-Ampifiers=Antenna-Amplifiers](#)

AF9Y = AF9Y  
[BVO = Eagle/DJ9BV](#)  
 BQH = VE7BQH  
[CC = Cushcraft](#)  
 CC MOD = VE7BQH  
 CD = CUE DEE  
 CD MOD = VE7BQH  
[CT1FFU = CT1FFU](#)  
 DD0VF = DD0VF  
[DG7YBN = DG7YBN](#)  
[DJ9BV = DJ9BV](#)  
[DJ9BV OPT = DJ9BV](#)  
[DK7ZB = DK7ZB](#)  
[Dual = Antennas-Amplifiers](#)  
 EKM MOD = SM2EKM  
[F9FT = F9FT](#)  
[Flexa = FlexaYagi](#)  
[G0KSC LFA = G0KSC](#)  
[G4CQM = G4CQM](#)  
 HG = HYGAIN  
[IOJXX = IOJXX](#)  
 IK0BZY = IK0BZY  
[InnoVAntennas = G0KSC](#)

K1FO = K1FO  
 K2GAL = K2GAL  
 K5GW = Texas Towers/K5GW  
 KF2YN = KF2YN  
[M2 = M2](#)  
 MBI = F/G8MBI/F5VHX  
 OZ5HF = Vargarda  
 RA3AQ = RA3AQ  
 RU1AA = RU1AA  
 SHARK = SHARK (Italian)  
 SM2CEW = SM2CEW/VE7BQH  
 SV = Svenska Antennspecialisten AB  
[Tonna = F9FT](#)  
 UA9TC = UA9TC  
[UR5CSZ = UR5CSZ](#)  
 Vine = G0KSC Design  
[WiMo = WiMo](#)  
 W1JR = VE7BQH (Mininec error)  
 WB9UWA = WB9UWA  
[YU7EF = YU7EF](#)  
 YU7XL = YU7XL

Using this Chart:

**Programmable Tsky and Tearth:** Tsky and Tearth may be changed to meet a Stations individual characteristics. Click on the Red number to change then click on the green to set.

Antennas with good G/T can provide significant benefit with today's high noise levels. Other factors like ease of matching and wet weather performance should be considered in the the decision making. Antennas with 50 ohm feed systems and good VSWR bandwidth (Q) m Lionel H. Edwards

VE7BQH  
 Issue 18, March X, 2020

Issue 1: Add YU7EF 32,InnoV 34 LFA,InnoV 38 LFA,InnoV 40 LFA,DG7YBN 19,KF2YN Boxkite 4,KF2YN Boxkite 4,KF2YN Boxkite 7,  
 Issue 1: Add KF2YN Boxkite 10,KF2YN Boxkite 13,KF2YN Boxkite 16,KF2YN Boxkite 22,WiMo 27 (YU7EF),DG7YBN 14,DG7YBN 23,  
 Issue 1: Add DJ9BV OPT70 8.5wl,WiMo 15 (YU7EF),InnoV 24 LFA,InnoV30 LFA,  
 Issue 2: Add DJ9BV OPT70 13wl,K1FO 22,K1FO 33,YU7EF 23B,DJ9BV BVO70 8.5wl,Tonna 21 DX,Konni F20,  
 Issue 2: Add YU7EF 27,24,21,19,18,15,14,13,12,11,10,IOJXX 30,IOJXX 25,IOJXX 16,RA3AQ 14,RA3AQ 30,RA3AQ 24,  
 Issue 2: Add RA3AQ 21,RA3AQ 18,InnoV 20 LFA,InnoV 19 LFA,InnoV 18 LFA,InnoV 17 LFA,InnoV 16 LFA,InnoV 10 LFA,

Issue 2: Add KF2YN Polly 15 CR,18 CR,20 CR,24 CR,InnoV 1111 LFA,12 LFA,13 LFA,15 LFA,20 LFA,23 LFA, 33 LFA,  
Issue 3: Add YU7XL QY721104D14,YU7XL QY724104D17, YU7XL QY728107D21  
Issue 4: Add DG7YBN Tonna 19 mod,  
Issue 5: Add EAntenna 432LFA11,EAntenna 432LFA12,EAntenna 432LFA15,EAntenna 432LFA18,EAntenna 432LFA23,  
Issue 6: Add Hy-Gain UB-7031DX,M2 432-13WLA,M2 432-12EME,M2 432-9WLA,  
Issue 7: Add Directive DSEFO432-33,Directive DSEFO432-25,Konni F20,Directive DSEFO432-25XPOL,I0JXX 32JXX70 XPOL new ver,  
Issue 8: Add BVO70-7.2 modified,DG7YBN GTV 70-11W  
Issue 9: Add DG7YBN GTV70-25,DG7YBN GTV70-30  
Issue 10: Add Programmable Tsky and Tearth  
Issue 11: Add DG7YBN GTV70-8n,DG7YBN GTV70-17w  
Issue 12: Revised Konni F20 mod YBN,  
Issue 13: Add Revised YU7EF EF7018M-5,InnoV 12Y,  
Issue 14: Add InnoV 10 LFA 2018,Innov 12 LFA-430, InnoV 24 LFA 2019  
Issue 15: Add Innov 18 LFA 2019,Innov 19 LFA 2019,Innov 20 LFA 2019,Innov 21 LFA 2019,  
Issue 15: Add Innov 22 LFA 2019,Innov 22 LFA 2019-2,Innov 23 LFA 2019  
Issue 16: Tearth Kelvin updated,  
Issue 17: Update InnoV 18LFA 2019,Add Antennas-Amplifiers PA432-23-6A, Update InnoV 34 LFA B 2019,  
Issue 17: Update InnoV 40 LFA 2019,Add Innov 39 LFA 2019, Add InnoV 34 LFA A 2019,  
Issue 18: Add YU7EF EF7017XM-5, Antennas-Amplifiers PA432-26-7BGP,