

Subject: Actual Antenna SWR

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 To : TECH@WW
 From Peter LZ1LEN

Below is one little, easy for calculate formula with two tables, which could be a wake-up call for you. Don't over-trust the good looking indication of your precious SWR-meter, which is situated at your worktable. Because the SWR value at the input of antenna cable is not a actual SWR of your favorite "WONDER-antenna".

Description:

 You can calculate it yourself what is "the simple truth" with following simplified formula:

$$SWRa = \frac{b + c}{b - c}$$

where:

- SWRa = actual SWR at antenna input (cable far end)
- b = coefficient vs.actual cable attenuation in dB
- c = coefficient vs.checked SWR (SWRc) at cable input (measuring point)

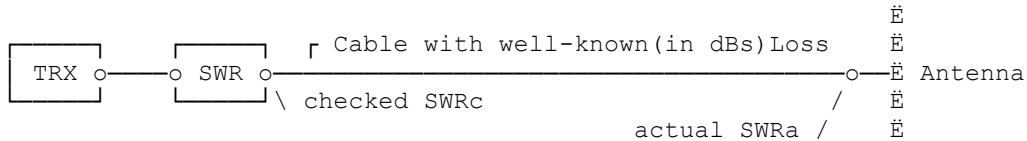


Table #1

 Values of "b" vs. actual cable attenuation in dB:
 Remark: At right side are shown approx.Cable Length
 for two typical cables at 145 MHz

dBs	b	RG-213/U	RG-58/U
0.0	1.0	0.0 m	0.0 m
0.5	0.8912	6.25 m	2.12 m
1.0	0.7943	12.5 m	4.25 m
1.5	0.7079	18.75 m	6.38 m
2.0	0.6309	25.0 m	8.5 m
2.5	0.5623	31.25 m	10.64 m
3.0	0.501	37.5 m	12.76 m
3.5	0.4466	43.75 m	14.89 m
4.0	0.3981	50.0 m	17.02 m
5.0	0.3162	62.5 m	21.2 m
6.0	0.2511	75.0 m	25.53 m
7.0	0.1995	87.5 m	29.78 m
8.0	0.1584	100.0 m	34.04 m
9.0	0.1258	112.5 m	38.3 m
10.0	0.1	125.0 m	42.55 m
11.0	0.0794	137.5 m	46.8 m
12.0	0.063	150.0 m	51.0 m

Table #2

 Values of "c" vs. checked SWR at cable input (measuring point)

SWRc	c	SWRc	c
1.0	0	1.8	0.2857
1.1	0.0476	1.9	0.3103
1.2	0.0909	2.0	0.3333
1.3	0.1304	2.5	0.4285
1.4	0.1666	3.0	0.5
1.5	0.2	4.0	0.6
1.6	0.2307	5.0	0.6666
1.7	0.2592	10.0	0.8181

Notes:

 * The cable attenuation in dB and SWR at antenna are actual values vs. actual frequency and all others (bad)influenced factors.

** For determinating of the antenna cable attenuation, you can use both programmms "Antenna Cable Loss and SWR" or "Antenna Cable Loss and SWR Calculator" on the address: <http://www.qsl.net/lz1len/projects.html>

Examples:

- 1) dBs=0dB (b=1); SWRc=1 (c=0); SWRa= $\frac{1+0}{1-0} = 1$ (Border case, the Dream)
- 2) dBs=2.5dB (b=0.5623); SWRc=1.5 (c=0.2); SWRa= $\frac{0.5623+0.2}{0.5623-0.2} = \frac{0.7623}{0.3623} = 2.1$
- 3) dBs=3dB (b=0.501); SWRc=1.8 (c=0.2857); SWRa= $\frac{0.501+0.2875}{0.501-0.2875} = \frac{0.7867}{0.2153} = 3.65$
- 4) dBs=3.5dB (b=0.4466); SWRc=1.8 (c=0.2857); SWRa= $\frac{0.4466+0.2857}{0.4466-0.2857} = \frac{0.7323}{0.1609} = 4.55$

5) Stop! Don't panic! A 5 to 1 SWR does'nt hurt anything :)

Have fun, a small SWR and 73 de Peter, LZ1LEN lz1len@qsl.net

Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP