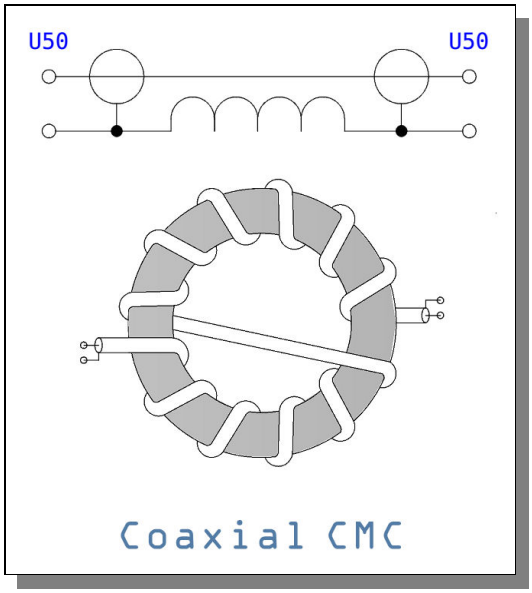
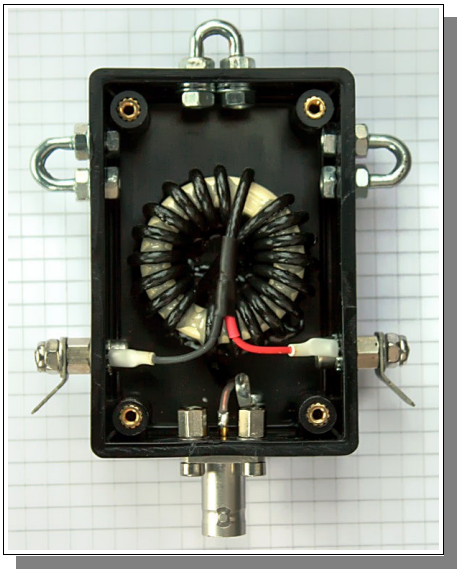
Coaxial - Toroid Choke for HF - 1 to 30 MHZ



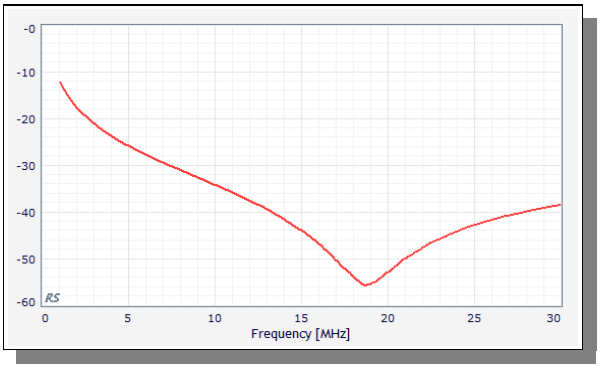
This is a simple coaxial-toroid mantel current choke (or current balun) to use with low-power transmitters and various antennas. Choke works on 1 to 30 MHz frequencies and is able to handle over 100W carrier power, with rather symmetrical loads.

Toroid	Ferroxcube **TX36/23/15-4C65**. Al=170 nH, u = 125. Ferrite material similar to FT140-61, try material 31 for lower frequencies.
Coaxial	Suhner, **RG174/U,** dielectic PE/PVC, 1.5kV High quality gable type: Suhner, RG316/U, dielectric PTFE/FEP, 0.8kV
Winding	Prototype (**9+1+9**) turns. Range (5+1+5) to (9+1+9), select by the target frequency range.
Inductance	About 61uH. Proto's self-resonance near 18 MHz.
Impedance	Over 500 Ω @ 3 to 30 MHz. Over 4000 Ω near self-resonance frequency.

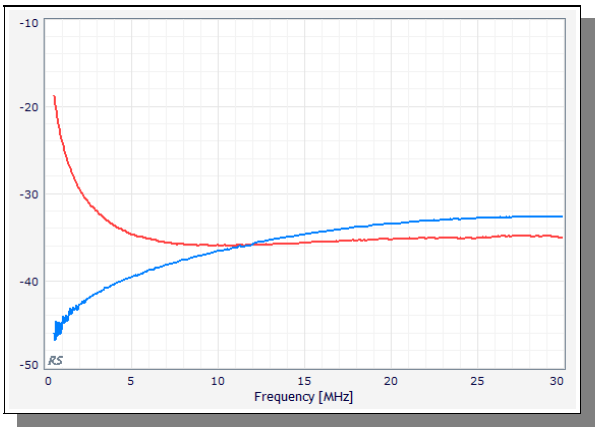
Traditional low-capacitance construction with split winding.



Boxed current balun, for use with dipole antenna.



Relative common mode attenuation, measured with VNA pro analyzer, transmission mode. Data not accurate. Self resonance seen near 18 MHz.



Return loss dB, measured with VNA pro analyzer, reflection mode.

Blue: 50Ω symmetrical resistive load.
Max SWR 1,05 at 30 MHz.
Min SWR 1,003 at 1 MHz.

Red: 50Ω unsymmetrical resistive load, hot side grounded.
SWR 1,13 at 1 MHz
SWR 1,04 at 5 MHz
SWR 1,03 at 10 MHz
SWR 1,04 at 30 MHz