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### **Technical report 300-QV-12 On 300 MHz quadrature volume coil for ferret imaging in vivo**

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Institute for Biodiagnostics

National Research Council Canada

For: Dr. Richard Buist, University of Manitoba, Winnipeg

## **Technical report 300-QV-12**

On 300 MHz quadrature volume coil for ferret imaging *in vivo*

Vyacheslav Volotovskyy and Boguslaw Tomanek

This technical report includes:

- description of the coil (page 2)
- schematics of the coil (Fig. 1)
- photo of the coil (Fig. 2)

The probe for a ferret head *in vivo* MR imaging incorporates a quadrature inductively coupled volume RF coil. RF resonator (eight element high pass birdcage) is embedded into the shielded matching/tuning assembly 170 mm long. RF system has adjustable tuning and matching. Inner diameter of the resonator is 48 mm, its length is 70 mm. Coil elements are made of 9 mm wide adhesive copper tape attached to the polycarbonate pipe. 12 and 13 pF capacitors are used to achieve a 300 MHz resonance frequency.

Total length of the set-up is about 170 mm, its outer diameter is approximately 90 mm. Inductive matching network is employed to connect resonator with a quadrature hybrid. Unloaded Q value for the coil is about 330. Quadrature isolation for an empty/loaded coil is better than 20/30 dB. Tuning range is from 300 MHz up to 306 MHz.

To tune and match the RF coil:

- Attach a cable connected to the channel of interest to the sweeper
- Leave a second (unused) cable attached to the quadrature hybrid input
- Turn matching rod responsible for the channel of interest to achieve a proper matching.
- Turn tuning rod responsible for the channel of interest to achieve a proper tuning
- Repeat the same procedure with a second channel

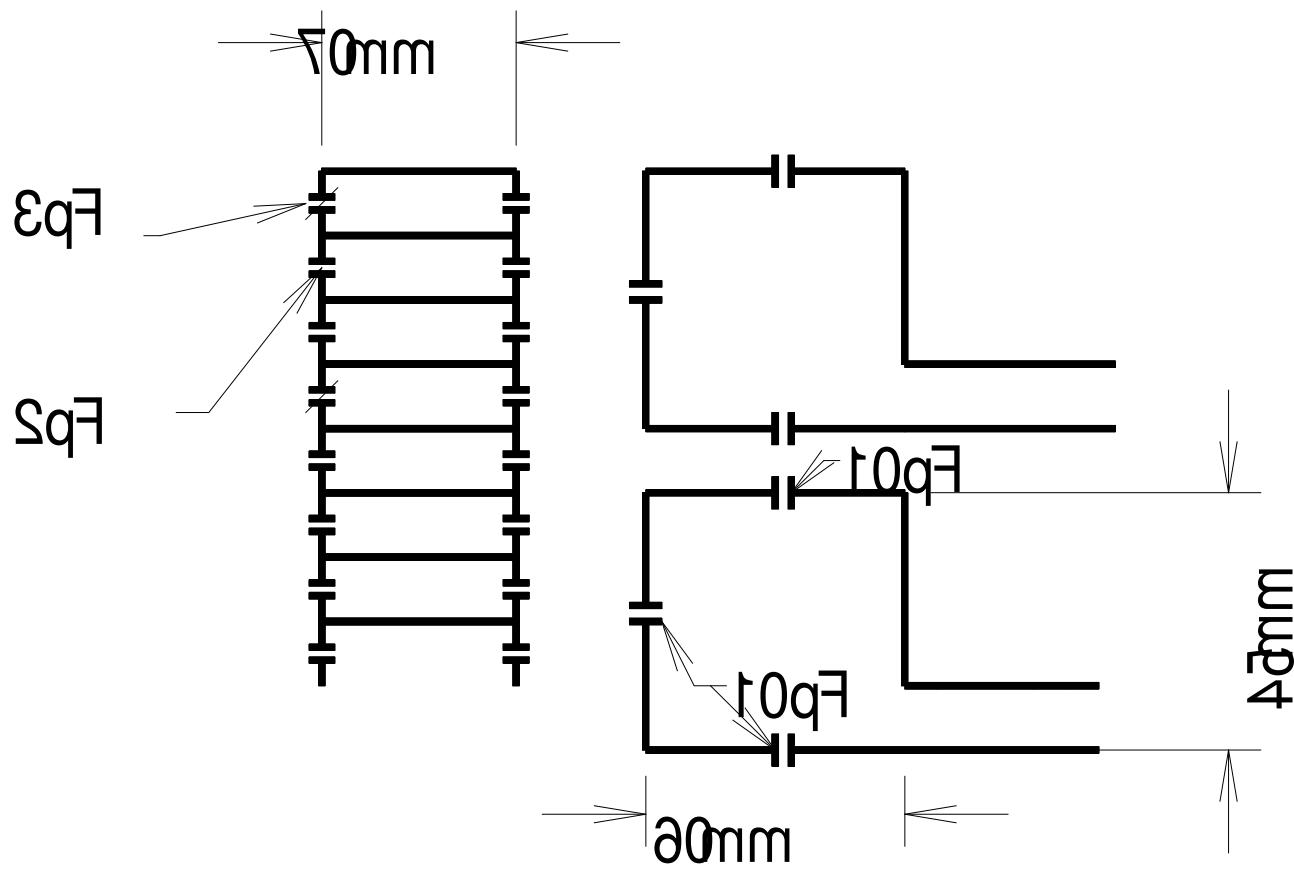


Fig.1. Schematics of the coil



Fig.2. Picture of the set-up.