



# MRI Coil Amplifiers (20120122, Dr. Tommy Vaughan)

**IP Status:** Issued US Patent; **Application #:** 14/102,467

## Amplifies Transceiver Antenna Elements

A magnetic resonance imaging (MRI) method and apparatus amplifies radio frequency (RF) signals from MRI coils. The coils, containing antenna elements, are power amplified by a distributed power amplifier with electronic devices (e.g., field-effect transistors). The approach locates an MRI coil with antenna elements within an MR magnet and amplifies its RF signal to obtain high-power RF pulses. These amplified pulses are then thermally and/or mechanically coupled to their respective antenna elements to form a hybrid coil-amplifier for MRI or spectroscopy machines.

## High Magnetic and Electric Field Compatible

The amplification can be performed remotely, as can adjustments of the gains, electrical resistances, inductances and/or capacitances that control the magnitude, phase, frequency, spatial profile, and temporal profile of the RF signal. The components of this technology are compatible with/function in high magnetic fields (up to and exceeding one tesla or even ten tesla or more, and/or an electric field of many thousands of volts per meter).

### BENEFITS AND FEATURES:

- Amplifies RF signals from MRI coils
- High-power RF pulses coupled to antenna elements form a hybrid coil-amplifier
- Remotely controlled amplification and adjustments
- Compatible with high magnetic fields and/or electric fields of thousands of volts per meter

### APPLICATIONS:

- High magnetic fields
- Magnetic resonance imaging (MRI)
- Spectroscopy machines

**Phase of Development** - Prototype development

### Researchers

Tommy Vaughan, PhD

*Professor, Biomedical Engineering, Columbia University*

### Technology ID

20120122

### Category

Engineering & Physical  
Sciences/Instrumentation,  
Sensors & Controls  
Engineering & Physical  
Sciences/MRI & Spectroscopy  
Life Sciences/Diagnostics &  
Imaging  
Life Sciences/Human Health  
Life Sciences/Medical Devices  
Life Sciences/MRI &  
Spectroscopy  
Software & IT/Algorithms  
Agriculture &  
Veterinary/Veterinary Medicine

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