CLAIMS

What is claimed is:

1. A method comprising:

transmitting an electromagnetic field from a ranging device disposed on a first bottom hole assembly (BHA), the ranging device including a solenoid and a plurality of separately activatable winding layers disposed over the solenoid, wherein the ranging device is configured to modify the electromagnetic field from a first magnitude to a second magnitude by selectively and separately switching the plurality of separately activatable winding layers on and off;

measuring the electromagnetic field with a receiver disposed on a second BHA to form a measurement set;

comparing the measurement set to a decay rate of the electromagnetic field; and

identifying a direction or a distance between the ranging device and the receiver.

2. The method of claim 1, wherein a current flows through the plurality of separately activatable winding layers in a first direction to form the electromagnetic field.

3. The method of claim 2, wherein the current flow through the plurality of separately activatable solenoid winding layers in a second direction opposite the first direction to form a second magnetic field.

4. The method of claim 1, wherein the solenoid is powered by one or more batteries, a turbine, or a capacitor.

5. The method of claim 1, wherein the receiver is a single, dual, or triaxial magnetometer that is configured to automatically increase or decrease a scaling resolution.

6. The method of claim 1, further comprising transmitting a secondary electromagnetic field from a second ranging device disposed on the first BHA.

7. The method of claim 1, further comprising adjusting a path of the first BHA with a first rotary steerable system (RSS) connected to the first BHA based at least in part on the distance between the ranging device and the receiver.

8. A system comprising:

a first bottom hole assembly (BHA) comprising a ranging device with a plurality of separately activatable winding layers that transmits an electromagnetic field, wherein the ranging device is configured to modify an electromagnetic field from a first magnitude to a second magnitude by selectively and separately switching the plurality of separately activatable winding layers on and off;

a second BHA comprising a receiver that measures the electromagnetic field to form a measurement set;

an information handling system that:

compares the measurement set to a decay rate of the electromagnetic field; and

identifies a distance or a direction between the ranging device and the receiver.

9. The system of claim 8, wherein the ranging device is a solenoid.

10. The system of claim 9, wherein the number of the plurality of separately activatable winding layers that is activated determines a variable strength of the electromagnetic field.

11. The system of claim 9, wherein a current flows through the plurality of separately activatable winding layers in a first direction to form the electromagnetic field.

12. The system of claim 11, wherein the current flows through the plurality of separately activatable winding layers in a second direction opposite the first direction to form a second magnetic field.

13. The system of claim 9, further comprising one or more batteries, a turbine, or a capacitor that powers the solenoid.

14. The system of claim 8, wherein the receiver is a triaxial magnetometer.

15. The system of claim 8, further comprising a second ranging device disposed on the first BHA that transmits a secondary electromagnetic field.

16. The system of clam 8, further comprising a first rotary steerable system (RSS) connected to the first BHA and altering a path of the first RSS based at least in part on the distance between the ranging device and the receiver.