

Assembly

1. A plastic or wood platform is placed at the bottom of the hole in the core so that the position of the magnet is moved up. The magnet is placed in this socket, above the platform. The fit should have low tolerance. If it is too loose, an adhesive should be used to fix the magnet in place.
2. Two disks with greater radius than the core should be fixed on the top and bottom of the core, so that the wire will not slide off. The insulated copper wire (42-44 gauge) is wound around the ferrite or steel core, preferably with a winding machine, as the number of winds will be several hundred (to be determined). There should be near 1cm of wire extending off from the last wound. For terminology, let the forward direction of the coil be in the direction it was wound. So that the winding began at the “bottom” of the coil and ended with the extension of wire at the “top”.
3. The mu-metal or permalloy case is placed around the assembly.
4. Two of such assemblies are built, with both coils wound the same way*, and the two magnets oriented antiparallel, so that one has its north pole pointing towards top—the loop with the extension of wire—and the other with its north pole facing the bottom—the loop where winding began (see 1.). The two coils soldered together at the extending wires.
5. The pickup is mounted on a wood or plastic board. The board must have a hole to allow exterior wires or probes to connect to the coils.

*Both should either be clockwise or counterclockwise ‘*through*’. This means that rotational direction of the winding is taken from the perspective of the actual current moving through the coil, from one end to the other. It will be the same in both directions, since starting from another end means reversing both the perspective frame and the motion through the windings, analogous to two multiplying by -1 twice.