Small magnetic loop antenna for hams

Franz Fiedler (1885-1956) Children and Radio 1925 My name is Alexandre Grimberg, PY1AHD, and I was born in October, 1949, in Rio de Janeiro, Brazil. I started in electronics when I was 10 years old, when I got hooked on crystal radio. I got my first radio license my first time was 22 years old after a long period being QRT, I returned to radio injury of the year 2000, in a new QTH as a restrictive antenna ham. This was not a problem at all, considering my passion for portable QRP operations. A year later, I placed my hands on a Yaesu FT-817, an incredible piece of evil technology---a portable jewel that I've dreamed of throughout my life. My challenge was to create an HF antenna truly portable and efficient as a companion for the FT-817 during the outside of my mini-expedition. A friend of mine, Flavio Pohlmann, PY1ZFP, who lives in Montreal, showed me a magnetic house loop with the diameter of a DVD and told me how impressed he was with this small antenna. After Flavio explains the basic parameters of antennas in the magnetic antenna, two hours later I had scaled the antenna to cover 6-12 meters. I used a diameter 45 cms RG-213 cable coaxial cable connected to a standard 3 PF 30 PF. variable capacitor. The very day I put the antenna and the FT817 in my car to go to the mall where I worked at that time. As soon as I had packaged the car at around 11:00 am, I connected this small loop ft-817 and responded to a Chile station called CQ about 10 meters and gave me a 59% report! I returned around 6:30pm in the parking lot to check the proliferation, and the work of a Texas station that gave me an excellent report. From the moment I decided to invest all my efforts and time in designing and testing fields my own magnetic loop antenna. It was a big challenge because there was very little information back then about small magnetic towns available on the internet. Today there are calculation programs that make the life of a magnetic-buckle home-brewer a brewer, but when I get started in 2001/2002 I had to spend a lot of time using the trial and error method-cut cables a quarter to an inch at a time, and write down the results. On top of this page, you'll see a few dozen examples of how to build your own magnetic loop. You can make your first small magnetic town spend almost nothing. The most important part is the variable capacitor. That capacitor can be a butterfly or a split-stator type, but if you don't have one you can get started with whatever you have at hand. Just use a piece of RG-213 koaxial cable for the loop, and have fun. For those looking for a ready-to-use solution, I offer the AlexLoop Walkham. The AlexLoop Walkham was the result of more than 12 years of working hard to develop a really portable HF antenna that can be used anytime and anywhere. All the antennas carefully by myself, and they are fully tested Load. Notebook showing small Magnetic Loop antenna results by cutting and testing methods. I will try to explain in some words how the magnetic loop antenna works. 1) The magnetic antenna loop is a transformative RF. The main is the small inner loop which is 1/5 in the size of the main loop. The secondary is the main loop, and is the current antenna. This outside conductor is closed by a mixed variable capacitor. The two towns are isolated, with no electric contact between the inner loop and the outer loop. 2) Loop's magnetic antenna is a high Q device, so the pleasan is very narrow. Even minor frequency changes will require you to return the antenna, but the Antenna Exchange provides superior rejection of desired signal reception – providing better finds and the lower SWR on transmitting. 3) The magnetic antenna loop can be used for either vertical or horizontal polarization, and the small size makes it easy to switch between the two. 4) In most radio activities we use the loop in the vertical position supported by a small pole. The antenna can be turned freely in both directions to minimize or even completely eradicate man-made noise coming from other directions. This position provides a figure-8 radiation model similar to larger dipole antennas. For condo windows, hotel balcony, and other limited space locations, we use the loop in the horizontal position, which (of course) provides vertical polarization and a directional omni radiation pattern. 5) The small magnetic loop works perfectly at low height. A single loop diameter meter will work perfectly a meter above ground .6) the magnetic loop doesn't need counterpoises, making it ideal for temporary operating location, or for situations in which there is no room available for counterpoise wire. Historic references to magnetic town portable antennas Balkans in 1942 Alder-shot England, November 1937 AlexLoop Walkham Portable Little Magnetic Loop Antenna AlexLoop Walkham Little Magnetic Loop Lantern can quickly ride and unfold for easy carry. The field tests confirmed more than 800 QRP DXs and has even set a world record distance that is recorded in the Hall of Fame as help records by the HF Pack Group: HF Pack Hall of Fame AlexLoop Walkham Little Magnetic Loop Antenna features easy tune in 5 seconds any frequency between TSO 6.9 MHz and 30MHz You simply need to adjust the build to the tune puck signal in receiving mode and then fine tune in transmit mode to lower the SWR No pipe on coil for changed stripes and no whip adjustment needs to fine tune. Everyone who features above with the incredible freedom of not requiring a window counterpoise Window Monted AlexLoop Walkham Magnetic Loop Antenna the ultimate solution for Hams and Antenna the unique restrictions low design offers a for antennas related to short listening to waves. You can use the alexLoop Walkham antenna supported on windows, balcony or even inside your radio cabin. A discreet antenna that can be used and finally removed from the window or balcony once radio communications have completed the perfect companion for the traveling trunk. AlexLoop Walkham Portable Surgery AlexLoop Walkham carries e-mail bags: py1ahd@ig.com.br Live and operates from a daring QTH does not mean that one cannot take part in Amateur radio. In my case our garden is too small for towers and long threads and there is a hill right behind the house anyway. Instead of feeling discouraged I took this as a challenge to get QRV with minimal power, occupying minimal space and – last but not least – have the whole thing sitting inside the house. The antennas I use are small antenna magnetic loop lanterns. The main features are the use of the magnetic component of the electromagnetic field for both transmission and reception. The widely used Yagi (Television Corridor) antenna for example uses elements of electrical fields. On the transmit and receive side of the stuff I am using a Yaesu FT818ND transceiver with maximum 6W power output. For my WSPR experience a Raspberry Pi Zero bay 10mW. DISCLAIMER: I take no responsibility for any damages or losses caused by the building and or operating of the antennas described here. Please be aware that even with only a few watts transmitting the voltage power of the wicked capacitor can reach several hundred Volts or even more and actual up to a few Amperes. I do not recommend this project to people with a cardiac pasmake or ICD. This is the basic antenna design: This configuration uses a Raspberry Pi Zero as WSPR transmitter for 20m and 40m. Thank you going to Jenny List and her Australia project that inspired me to try a pizero on a loop. Otherwise the FT818ND can be connected to the food loop as well. This one is smaller with a slightly different fee: Designed mainly for 50 Mhz/6m strips. Two brass sheets act as when gap tyre capacitor. A small, blocked loop or magnetic antenna is defined as a loop antenna of less than one tenth of one-quarter to a length of circumference. These are normally constructed as a single turn of heavy-gauge wire (AWG #10 or larger), copper pipe or tube and are amazed at one specific frequency at a time using a variable serial capacitor. As these antennas can be constructed in relatively little space, often with a diameter of several feet or less, they are used in HF applications where no suitable location is available for a full-size antenna such as antennas in size. In some cases, these were constructed of items or used for portable operations. While a circular loop is effective in that it provides the largest area for anyone given the length of the conductor, other forms (such as a square consisting of copper pipe and 90° elbow) they have also been successfully working. The theory of OperationA Wire Buckle naturally acts as an indicator with a radiation resistance to a fraction of an ohm. In order to maintain other resistance and fingerprints from becoming predominant, the resistance must be kept to a minimum of transmitted antennas by the use of heavy wire or tubes and indications of the loop must be compensated using a large serial capacitor. This yield a lantern that operates as a reasonable LC circuitry at one specific frequency and a very close impedance to zero; at other frequency, fingerprint increases well and the antenna is unresponsive. Due to the need to keep anticipation low, the capacitors used to be effective serial resistance to near-zero, despite their handling of large amounts of current voltage and RF which (at any larger than a QRP operation) often are reached 4V or more. As the circuit is widely built into reactive components, voltage and currents of individual points far beyond those that normally would be associated with the real power being transmitted. Capacitors must also have variables on a wide range to allow the loop to be manually tuned to one of various frequency and music bands within the HF spectrum. Vacuum capacitor variables are very well suited to this task but possibly costly even from industrial-begged sources. A possible alternative is an air-variable capacitor in which all connections to individual plates are welded and no connection is moved to the rotor. The butterfly capacitors (MFJ-19, MFJ-23) is a split-stator capacitors based on this approach; an air-variable design, it effectively has two stator (one that connects to each end of the loop) and a rotor that moves between adjusted capabilities. No direct electrical connection tuned to the rotor; no brushes or slippery rings. Some amateur radios have constructed their own capacitor for use in blocked loop antennas; these are usually air-variable capacitors built in individually-car plates or trombone capacitor in which two concentrated pieces of the copper pipe are separated by an insulator and one slide to the other to vary the condenser. As the circuit is highly frequency-selective, often a means desired remotely adjusted ability to tune the antenna to the desired frequency frequency. Reduction drives can be used to convert a single-turn capacitor variable to more fine-stiff multilayer controls and engines (such as steps designed for computer printers or servo to use in radio-control operations) can provide a means to tune the controlled antenna. Feedpoint matcheAs the fingerprint of antennas in the near-zero antenna, it must match the highest impedance (typically 50Ω) of the transmitted equipment. Possible methods to match the transmitter in the loop are: Matching loop - A loop, typically no more than one-fifth the size of the main loop, is constructed and installed adjacent to one corner of the main loop and used to couple the signal inductively. Delta match – A small portion of the loop is used as an autotransformer by connecting two pipes to a portion of the loop circumference, usually at the most distant point from the capacitor. These then connect using a balancing line (two worcester of equal length and size) in a batch or match feed as a load balancing. Host match – The transmitter is matched to the antenna kapacitivelyGamma match – Is the shield of an unbalanced line connected directly to the circumference of the loop at a point directly opposite the capacitor directly. The center conductor is then installed, without lack, in a 1 space from the loop and hard-tuned to the loop at a further point – effectively forming an unbalanced matching loop that includes part of the main loop as a side of the breakfast loop. External links160m Short TX Loop antenna, WE6WThe AEA IsoloopAntenne Cadre Molding F5NGZ+ Description F5TZ, QRP FR (highlights français)DJ3TZ's Small Tuned Loop Antenna PageSee also A small receiving loop with a good frequency rangeExperiences with Loop antennas at G3YMCMagnetic Loop for 80m – 40m, HB9MTNMy Magnetic Loop Antenna, KR1ST – The small transmitting loopPortable HF Transmitting Loop Antenna, N5IZUPractical Experiments with Magnetic Loop antennas, David Reid PA3HBB/ G0BZFA Small Transmitting Loop Antenna for 14MHz and 21MHz, Lloyd Butler VK5BR, Unprofessional Radio, November 1991.Small Transmitting Loop Antennas, AA5TB (includes aa5tb_loop_v1.22a.xls small loop spreadsheet calculator)Stealth Amateur Radio, G4ILOAn Unusual Excessive Band Magnetic Loop Antenna (for 14 and 10 MHz), OKFOU